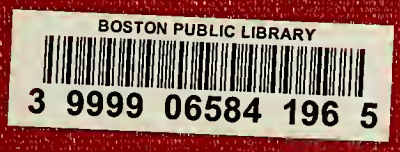
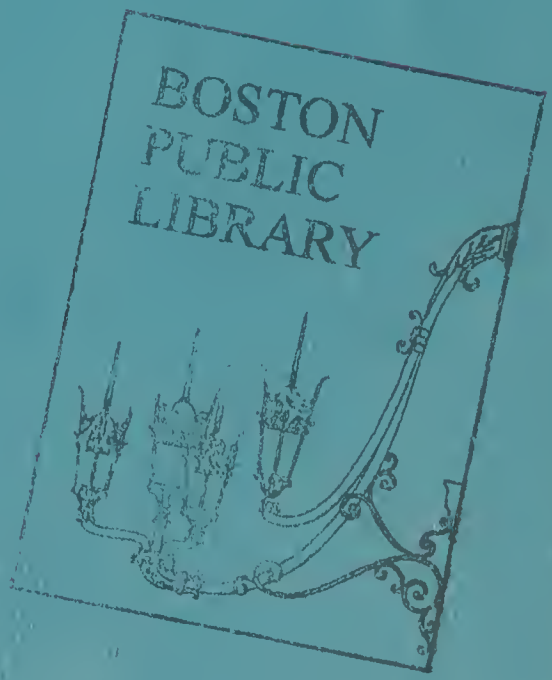


ENVIRONMENTAL IMPACT ASSESSMENT OF THE PROPOSED U.S.D.A. HUMAN NUTRITION RESEARCH CENTER



ENVIRONMENTAL IMPACT ASSESSMENT OF THE PROPOSED U.S.D.A. HUMAN NUTRITION RESEARCH CENTER, BOSTON, MASSACHUSETTS

Prepared for
Shepley, Bulfinch, Richardson and Abbott, Inc./Desmond and Lord, Inc.
and the
United States Department of Agriculture, Beltsville, Maryland

June 1979

METCALF & EDDY, INC.
ENGINEERS & PLANNERS
BOSTON / NEW YORK / PALO ALTO / CHICAGO

UNITED STATES DEPARTMENT OF AGRICULTURE
SCIENCE AND EDUCATION ADMINISTRATION

AGRICULTURAL RESEARCH
NORTHEASTERN REGION
OFFICE OF THE REGIONAL ADMINISTRATOR
BELTSVILLE, MARYLAND 20705

JUL 16 1979

SUBJECT: Environmental Impact Assessment for the Proposed Human Nutrition Center, Tufts University, Boston, Massachusetts

TO: Steven C. King, Regional Administrator

Attached is the detailed Environmental Assessment on this project prepared by the firm of Metcalf and Eddy, Inc., subcontractor to Shepley, Bulfinch, Robertson and Abbott, Inc./Desmond and Lord, Inc., as directed by the Science and Education Administration, U.S. Department of Agriculture. Following a detailed review of the comprehensive analysis, the Northeastern Region Environmental Assessment Committee has determined that though this is a major project in size, the overall impact on all aspects is judged to be not significant and no controversy, based upon environmental factors, is anticipated. Therefore, an Environmental Impact Statement is not required for the proposed action.

If you concur with the findings of this Committee, please indicate your approval, and this memorandum will become an official part of the environmental analysis. Copies will be made available to all concerned agencies and anyone who submits a request.

G. E. [illegible]
Assoc[illegible]
for [illegible]

Enclosure

Approved:

Steven C. King

July 23, 1979

Date

50 Staniford Street Boston Massachusetts 02114
617/367-4000 TWX 710 321 6365 Cable Address: METEDD-Boston

Metcalf & Eddy, Inc.
Engineers & Planners

June 29, 1979

Mr. Richard Potter
Shepley, Bulfinch, Richardson & Abbott
One Court Street
Boston, Massachusetts 02108

Dear Mr. Potter:

In accordance with your authorization to examine environmental impacts associated with the Proposed U.S.D.A. Human Nutrition Research Center, we are pleased to submit the enclosed Environmental Impact Assessment.

It has been a pleasure working with you on this project and if we can be of further service, please do not hesitate to contact me.

Very truly yours,

METCALF & EDDY, INC.

William C. Finn

William C. Finn
Project Manager

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SUMMARY OF ENVIRONMENTAL IMPACTS OF THE PROPOSED USDA HUMAN NUTRITION RESEARCH CENTER

What Is the Human Nutrition Research Center?

The United States Department of Agriculture (USDA) Human Nutrition Research Center will be a research facility for the study of human nutrition with emphasis upon adults and the aging. The facility will be owned and operated by USDA.

Where Will It Be Located?

The Center will be located on a 20,000 square foot site in downtown Boston at the southwest corner of the intersection of Stuart and Washington Streets, next to the Music Hall and across from the Tufts Dental School. A 14-story 206,000 square foot building has been designed. The site is currently used for surface parking.

What Facilities Will It Have and Who Will Work There?

The Center will have facilities designed for its special purposes, including a research unit where 28 volunteers can be housed for long-term research studies; an area for 30 to 50 outpatients participating in local nutritional studies; office facilities for the staff; laboratory facilities; and quarters for small animals. The Center will employ 238 people.

How Much Will the Center Cost?

The Center is estimated to cost approximately $20 million. It is 100% Federally funded.

When Will Construction Start?

Construction of the Center is planned to start in July 1979 and will be completed in October 1981.

How Does the Center Fit Into the South Cove Urban Renewal Project Plans?

The site for the Center is designated for hospital uses in the South Cove Urban Renewal Plan. The Nutrition Center is compatible with that land use category.

Will the Construction and Operation of the Center Affect Noise Levels in the Area?

When the Center is operational, it should not significantly affect noise levels in the area and will comply with the City of Boston noise regulations. During construction, there will be a significant short-term adverse noise impact associated primarily with the operation of pile drivers. The buildings that will receive most

of the noise impacts are the Music Hall, Tufts Dental School and the Proger Building. The Don Bosco School, Boston Floating Hospital and Quincy Towers will also be affected, but to a lesser extent. Substantial noise mitigation measures will be undertaken. Nevertheless, adverse noise impacts during construction are unavoidable.

How Will Traffic and Parking Be Affected?

The Center will generate approximately 250 vehicle trips per day. These trips will not significantly affect the existing heavy traffic volumes in the project vicinity.

The Center will be eliminating a current parking lot (100 spaces) and will not be providing on-site parking for its employees. The Center will, therefore, increase parking demand in the area. There currently appears to be sufficient capacity in other nearby garages to handle the increased parking demand.

Can the City's Utility Systems Accommodate the Needs of the Center?

The site is served by a water main, sewer, storm drain and gas line with adequate capacities for the operations of the Center.

Will Any Chemicals or Radioactive Materials Be Used at the Center?

Chemicals such as solvents and acids will be used at the Nutrition Center for food analysis and fat extraction studies. The Center has been designed with the appropriate laboratory equipment to handle these chemicals including hoods to trap vapors and a neutralization tank for disposal of acid wastes.

Some low level radioactive isotopes will be used in the Center for labeling and tracing nutrients in animals or laboratory experiments. A radiation safety officer will oversee the use and disposal of radioactive materials.

Will the Center's Heating System or Exhaust System Have An Adverse Affect on Air Quality in the Area?

An oil-fired boiler system will be used to heat the Center. The stack emissions from the heating system will meet State air quality standards and be approved by the Massachusetts Department of Environmental Quality Engineering. Exhausts from laboratory operations and from animal quarters will be discharged from roof top exhaust ducts. Typically, treatment is not required. Where treatment is required, appropriate provisions have been made for such treatment. The State Public Health Department will review emissions from the animal quarters and laboratory levels.

What Will Be the Effect of the Center on the Socioeconomic Environment?

The USDA Center will have beneficial social impacts related to the progress in nutritional research that will be made there over time. In addition, the locating of the USDA Center in Boston will have beneficial citywide impacts since the Center will contribute to the image of the City of Boston as a vital center for top quality

health, educational and research facilities. The Center will have no significant adverse impacts on the socioeconomic environment of the Chinese community that lives and works in the area near the proposed site; however, siting the Center in that area may result in some short-term increase in resentment of the Chinese community toward medical institutions and other development interests in the vicinity.

Does the Center Contribute to the Cumulative Construction Impacts of Development Projects Planned in the Vicinity of the USDA Site?

Construction of major commercial, residential and office development in the vicinity of the USDA Center will occur continuously through 1983. Between 1980 and 1981, 11 projects will be under construction concurrently; the impacts of constructing the USDA Center may serve to aggravate disturbances caused by these other projects, but would be insignificant (except for noise during pile driving) when compared with the disruption anticipated from the other projects.

REPORT

CHAPTER 1

PROJECT DESCRIPTION

The United States Department of Agriculture (USDA) is proposing to build a Human Nutrition Research Center in downtown Boston. The USDA Human Nutrition Research Center will be a new resource for the study of human nutrition, with emphasis upon the human nutritional requirements of adults and the aging. The scientific programs of the Center as defined by USDA will be carried out by a multidisciplinary research team and will address the following issues:

1. The nutritional requirements for optimal health and well-being, including methods to monitor the nutritional status of human populations.
2. Ways in which diet and nutritional status influence the onset and rate of progression of the aging process.
3. Ways in which diet and nutritional status, by themselves, or in combination with other factors can prevent or retard degenerative diseases and processes associated with aging.

The Center will consist of a 206,000-square foot, 14-story plus basement building with specialized facilities designed to meet the purposes of the Center. These facilities include:

1. A clinical research unit in which 28 human volunteers can be housed comfortably for long-term (six months or longer) research studies. Facilities for these

volunteers include a swimming pool, deck tennis, exercise room, sauna, dining facilities, library and music room.

2. An area for managing the 30 to 50 outpatients who would be participating in local community nutritional studies.
3. Office facilities for the staff of the Center.
4. Laboratory facilities suitable for human nutritional investigations and related experimental animal research.
5. Animal quarters for long-term studies.
6. An exhibition hall and a lecture hall with a seating capacity of 310 people.

The drawings included in the tentative architectural submission, January 8, 1979, to U.S.D.A. show in detail the plans for the Center. The architects for the Center are Shepley, Bulfinch, Richardson and Abbott/Desmond and Lord.

The Center will be built on a 19,764 square foot site located at the southwest corner of the intersection of Washington Street and Stuart Street (See Figure 1). The site is presently used for parking and part of it is owned by the Boston Redevelopment Authority (BRA), and part by the New England Medical Center Hospital (NEMCH).

The area in which the site is located is known as the Tufts-New England Medical Center (Tufts-NEMC) area. This area is part of the BRA's South Cove Urban Renewal Project. The area is

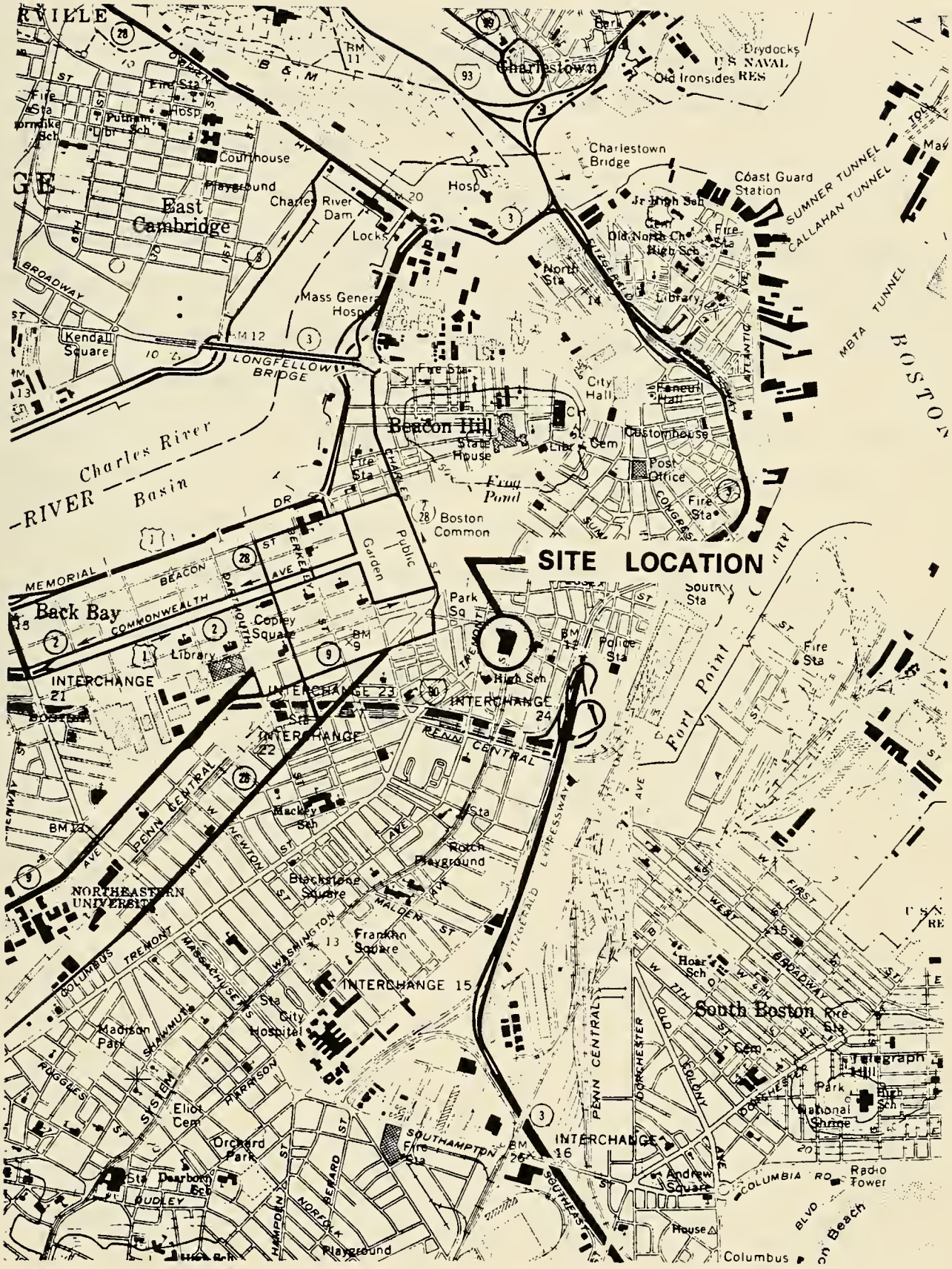


FIG. 1 PROJECT AREA LOCATION

easily accessible to major highways, including the John F. Fitzgerald Expressway (State Route 3) and the Massachusetts Turnpike (Interstate 90).

The Center will employ 238 people, the majority of whom are researchers and technicians for the nutrition studies. Projected personnel categories for the Center are listed in Table 1.

The Center is funded through a Congressional appropriation in FY (Fiscal Year) 1978 and 1979 for a maximum amount of $21,100,000 for construction and $2,000,000 for design and planning. The estimated cost of the Nutrition Center is $20,000,000. The remaining funds are for contingencies.

As presently planned, construction of the Center will commence in 1979 and will be completed in 1981.

TABLE 1. PROJECTED PERSONNEL FOR THE NUTRITION CENTER

Office of the Director	
Director	(1)
Assistant Director	(1)
Technicians	(2)
Secretaries	(2)
Clerk	(1)
Total	7
Clinical Unit	
Researchers	(10)
Dieticians	(3)
Nurses	(10)
LPN's	(6)
Dietary Asst.	(4)
Technicians	(39)
Secretaries	(6)
Clerical	(11)
Total	89
Data Processing	
Researchers	(2)
Programmers	(2)
Key Punch Operator	(1)
Photographer	(1)
Secretary	(1)
Total	7
Pathology	
Researchers	(6)
Technicians	(11)
Secretaries	(2)
Total	19
Physiology	
Researchers	(16)
Technicians	(28)
Secretaries	(4)
Total	48
Biochemistry	
Researchers	(12)
Technicians	(21)
Secretaries	(3)
Total	36
Animal Care	
Researchers	(1)
Technician	(1)
Caretakers	(10)
Secretary	(1)
Total	13
Administrative Office	
Administrative Office	(1)
Purchasing Agent	(1)
Purchasing Assistant	(1)
Clerks	(2)
Accounts Clerk	(1)
Secretary	(1)
COR (Contract Monitor)	(1)
Operations Engineer	(1)
Supply Clerk	(1)
Mail & File Clerk	(1)
Budget Technician	(1)
Personnel Clerks	(2)
Storage for mail, files, supplies, etc.	
Total	14
Building Management	
Engineer	(1)
Heating & A/C	(1)
Electrician	(1)
Plumber	(1)
Maintenance	(1)
Total	5

Source: United States Department of Agriculture.

CHAPTER 2

ENVIRONMENTAL SETTING

This chapter describes the environmental setting for the project as it currently exists. The description covers land use, transportation, historical and archaeological sites, infrastructure and water quality, air quality, noise, geology and topography, vegetation and wildlife, and socioeconomic characteristics.

Land Use

The site is located in downtown Boston in the Tufts-New England Medical Center area, which is part of the South Cove Urban Renewal Project. The site is presently used for a surface parking lot, a temporary use allowed by the Boston Redevelopment Authority until final development of the site occurs. The Tufts Dental School is located to the east of the site across Washington Street, and a major addition to the New England Medical Center Hospital is proposed adjacent to the site on the south. Also south of the site is the Don Bosco High School. West of the site is the theatre district. An addition to the Music Hall Theatre in this district will directly abut the site. Other nearby land uses are the adult entertainment district, which is north of Stuart Street, and the residential and commercial neighborhoods of the Chinese community, which are located primarily to the east of the site. The newer Chinese housing developments of Quincy Towers, Mass. Pike Towers and Tai Tung Village are located to the south, southeast and southwest of the site. The

residential neighborhood of Bay Village is also located to the southwest of the site. The Park Plaza Urban Renewal Project abuts the site to the north. Figure 2 shows the buildings and land uses in the vicinity of the site.

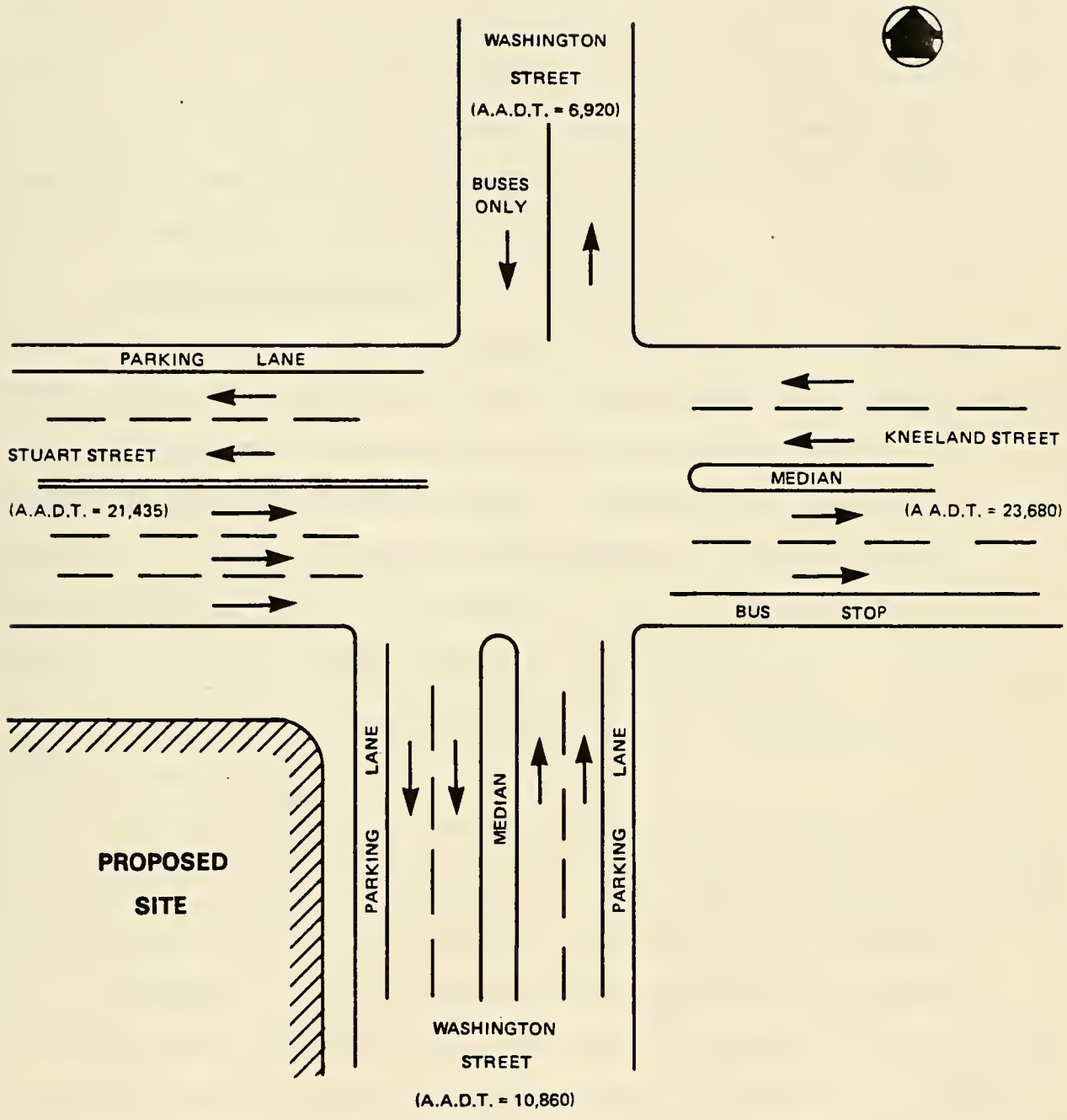
Transportation

Street System. The Southeast Expressway (State Route 3) and the Massachusetts Turnpike (I-90) interchange meets to the southeast of the site. The proximity of the site to these limited access facilities means that the site is highly accessible to the entire metropolitan Boston area. The existing streets bordering the site, Kneeland Street, Stuart Street and Washington Street, are all major city streets (see Figure 3).

In October, 1978, Intersection Turning Movement Counts were performed at this location over a period of 11 hours for each of two days. From these counts, Annual Average Daily Traffic (AADT) volumes were determined. The average daily traffic volumes for the streets bordering the site are: Washington Street (north of the intersection) - 6,920 vehicles; Washington Street (south of the intersection) - 10,860 vehicles; Stuart Street - 21,435 vehicles; and Kneeland Street - 23,680 vehicles. Traffic volumes on an hourly basis are consistently heavy on all of the streets, but volumes reach their daily peak at approximately 5:00 p.m.

Phase I of the Park Plaza Project provides for street improvements, including widening, to Stuart Street in this location. Opposing left turn lanes will be provided for Stuart Street

FIGURE 2 VICINITY MAP



NOT TO SCALE

FIG. 3 STREET SYSTEM (EXISTING)

and Kneeland Street and a drop-off/bus stop lane will be added to Kneeland Street. Exclusive pedestrian phases may be included in the traffic signal cycle. These proposed improvements were designed to take into consideration the development of this site for the Human Nutrition Research Center.

Public Transportation. The project site is located in excellent proximity to public transportation. It is two short blocks from the Massachusetts Bay Transit Authority (MBTA) Orange Line stop at Essex Street and three blocks from the Boylston Street station of the Green Line. Access to the Red Line is available at the Washington Street station at Summer Street. A new Orange Line station is currently under construction in the same block of Washington Street as the project site. The station will provide transit access directly to the Tufts-New England Medical Center area.

Several bus routes pass directly by the site. The project is also within walking distance from the South Station transportation terminal and the Greyhound and Trailways bus terminals.

Parking. As indicated, the project site is currently occupied by two parking lots. The total capacity of the two lots is 200 automobiles, 100 of which will be displaced by the Human Nutrition Research Center. The remaining 100 spaces will be displaced due to proposed development by the Music Hall, NEMCH and the Stuart Street improvements. The 100 spaces displaced by the Nutrition Center building currently generate approximately 660 vehicle trips per day. This vehicle trip generation is based on

information from the managers of the parking lots that two-thirds of the 100 spaces are currently occupied during the day by long-term parkers and one-third of the spaces occupied by short-term parkers, who remain for an average of two hours. In addition, this estimate includes trip generation for nighttime occupancy (by theatre and restaurant goers).

Tufts also has a major parking garage in this vicinity with a capacity of 930 cars. This garage is approximately 85 percent utilized, so that there are 140 spaces available. Other parking facilities in the area include the Eliot Street Garage on Stuart Street, with a capacity of 500 cars and several surface parking lots on Harrison Avenue, Washington Street and Ash Street, which can accommodate approximately 300 cars. The Eliot Street Garage is proposed for demolition as part of the Park Plaza Project and the surface parking lots may eventually be redeveloped for new uses. In addition to these facilities, however, there are several large parking garages in the site vicinity which are within a 10 minute walk of the site. These facilities, their rates and walking distances to the site are listed in Table 2.

Historical or Archaeological Sites

There are no reported archaeological sites in the project location.* There are also no historic buildings on the site, as the site is cleared land. In the nearby area, Jacob Wirth's at

*Boston Conservation Commission.

TABLE 2. PARKING GARAGES IN VICINITY

Garage	Walking time	Average daily Capacity	Average daily Occupancy(1)	Daily rate	Monthly rate
Systems Auto Park (Tufts-NEMC parking)	1-2 min.	930	85%	$3.00 ($2.00 for Tufts-NEMC employees)	$60 ($40 for Tufts-NEMC employees)
57 Park Plaza	4-5 min.	800	80%	$2.75	$60
Kinney Systems (Motor Mart)	4-5 min.	800	90-95%	$2.75	$75
Shoppers Garage	3-4 min.	500	75%	$2.50	No special monthly parking rate
Ed Robinson Metropolitan	6-7 min.	300	85%	$2.75	$55
Kingston-Bedford Garage	8-9 min.	750	50%	$3.25	$60
Lincoln-Essex Garage	8-9 min.	300	100%	$3.25	$65
Herald Street Garage	8-9 min.	400	25%	$1.00	-

Note: Only Systems Auto Park considers a significant amount of their business is due to Tufts-NEMC employees.

1. Estimated by operators of the parking garages.

Source: Survey conducted by Metcalf & Eddy, Inc., April 19, 1979.

31 to 39 Stuart Street is a Boston Landmark and the Washington Elevated Subway has been identified as eligible for the National Register.

Infrastructure and Water Quality

The site is served by all utilities. In Washington Street the project will connect to a 24-inch storm drain, a 42-inch combined sewer, a 16-inch gas line, and a 16-inch water main. Except for the 42-inch combined sewer, which is eventually proposed to be replaced, the utilities in Washington Street are relatively new (1973) and were designed to accommodate development in the area.

Utilities are also available in Stuart Street. Utilities include a 24-inch by 30-inch combined sewer which is proposed to be separated as part of the Park Plaza Project. The existing utilities in Washington Street and Stuart Street are shown on the Topographic Plan which was included in the tentative architectural submission to USDA by Shepley Bulfinch/Desmond and Lord, dated January 8, 1979.

Although storm drainage and sewer facilities in the site vicinity are presently separated or will be separated, the combined sewers currently carry combined wastewater flows. The flows from the 20-inch by 34-inch combined sewer in Stuart Street and the 24-inch storm drain in Washington Street enter the 42- inch combined sewer in Washington Street. During dry weather, these flows go to the East Side Interceptor. This interceptor is currently overloaded and there are dry weather overflows to the Fort Point Channel. The interceptor is scheduled for replacement

and design for the new interceptor should begin in May, 1979, with construction completed approximately five years from that time. During wet weather there are combined sewer overflows to the Fort Point Channel. The water quality in the Fort Point Channel is very poor. The Metropolitan District Commission (MDC) is currently addressing the problem of combined sewer overflows.

The East Side Interceptor carries the effluent to the Deer Island wastewater treatment facility. This facility has an average design flow of 340 mgd (million gallons per day) and a peak hydraulic capacity of 938 mgd. Currently, the facility receives 330 mgd of wastewater. The outfall for the Deer Island facility where the effluent is discharged is located in the Boston Harbor. A study by the MDC is evaluating impacts of discharged effluent from Deer Island and Nut Island on water quality and aquatic biota to see if further treatment or a relocation of the outfall(s) is necessary.

Air Quality

In addition to the authority contained in the Federal Clean Air Act to promulgate and enforce emission standards, the State of Massachusetts has adopted regulations providing for State action to control and abate air pollution. The State regulations are defined in the Massachusetts Air Pollution Control Regulations of the Massachusetts Department of Environmental Quality Engineering (DEQE). Massachusetts regulations also detail the necessary actions to be followed to obtain a permit for construction and operation of a source of pollution;

and to monitor, sample, record and report pollutant levels. Thus, Federal and State regulations provide air quality standards designed to control the total discharges of pollutants from both existing and future emission sources.

Two types of standards have been developed: primary standards to insure protection of public health; and secondary standards to protect property, vegetation and aesthetic values. These standards are presented in Table 3. The target date for attainment of the national primary standards is now December, 1982,* while secondary standards are to be achieved within a reasonable time period.

The proposed site is located within the Metropolitan Boston Air Pollution Control District. Air quality data for the two closest State air quality monitoring stations, Kenmore Square and the Callahan Tunnel, was obtained for 1976 and 1977 from the DEQE, Division of Air and Hazardous Materials. Data was available for SO_2 (sulfur dioxide), TSP (particulates), CO (carbon monoxide) and NO_2 (nitrogen dioxide). This data is presented in Table 4. Additional air quality data was available as part of the Final Environmental Impact Report for the New England Medical Center Hospital's Facilities Development Program, Boston, Massachusetts, July 31, 1975, prepared by Environmental Research and Technology, Inc. (ERT). ERT estimated CO concentrations in the immediate vicinity on Washington Street.

*U.S. EPA, Policy for Implementing Section 316 of the 1977 Clean Air Act Amendments.

TABLE 3. NATIONAL AIR QUALITY STANDARDS[1]

Pollutant	Averaging time	Primary standards[2]	Secondary standards[3]	Reference methods[4]
SO_2	Annual arithmetic mean	80 ug/m^3 (0.03 ppm)		
	24 hours	365 ug/m^3 (0.14 ppm)		Pararosaniline method
	3 hours	-	1,300 ug/m^3 (0.5 ppm)	
TSP	Annual geometric mean	75 ug/m^3	60 ug/m^3	High volume sampling method
	24 hours	260 ug/m^3	150 ug/m^3	
CO	8 hours	10 mg/m^3 (9 ppm)	Same as primary standards	Non-dispersive infrared spectroscopy
	1 hour	40 mg/m^3 (35 ppm)		
Photochemical oxidants (corrected for NO2 and SO_2)	1 hour	235 ug/m^3 (0.12 ppm)	Same as primary standard	Gas phase chemiluminescent
Hydrocarbons (corrected for methane)	3 hour	160 ug/m^3 (0.24 ppm)	Same as primary standard[5]	Flame ionization detection using gas chromatography

TABLE 3 (Continued). NATIONAL AIR QUALITY STANDARDS(1)

Pollutant	Averaging time	Primary standards(2)	Secondary standards(3)	Reference methods(4)
NO_2	Annual arithmetic mean	100 ug/m^3 (0.05 ppm)	Same as primary standard	Gas phase chemiluminescence

1. National standards other than those based on annual arithmetic means or annual geometric means are not to be exceeded more than once per year.
2. National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
3. National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
4. Reference method as described by the EPA. An "equivalent method" means any method of sampling and analysis which can be demonstrated to the EPA to have a "consistent relationship to the reference method".
5. Guideline to be used in assessing implementation plans.

TABLE 4. AIR QUALITY DATA - 1976 AND 1977

NITROGEN DIOXIDE (NO_2)

Method - Chemiluminesence
Units - ppm (parts per million)

Station	Annual arithmetic mean	Maximum 24-hour observation	Second maximum 24-hour observation
Kenmore	.046	.0145	.0129
Callahan	.046	.0148	.0130

SULFUR DIOXIDE (SO_2)

Method - Instrumental Colometric
Units - ppm

Station	Annual arithmetic mean	Maximum 24-hour observation	Second maximum 24-hour observation	Maximum 3-hour observation	Second maximum 3-hour observation
Kenmore	.019	.063	.059	.179	.162
Callahan	.014	.044	.036	.078	.076

TABLE 4 (Continued). AIR QUALITY DATA - 1976 and 1977

CARBON MONOXIDE (CO)

Method - Non-dispersive Infrared Spectroscopy
Units - ppm

Station	No. 8-hour observations above 9	No. days with 8-hour observations above 9	Maximum 1-hour observation	Second maximum 1-hour observation	Maximum 8-hour observation	Second maximum 8-hour observation
Kenmore	13	12	20	19	12	12
Callahan	24	18	23	23	15	15

PARTICULATES (TSP)

Method - High volume
Units - ug/m^3

Station	Annual geometric mean	Geometric standard deviation	Maximum 24-hour observation	Second maximum 24-hour observation	Number of observations above 260	Number of observations above 150
Kenmore	82	1.64	247	176	0	3

Source: Commonwealth of Massachusetts, Department of Environmental Quality Engineering, Division of Air and Hazardous Materials, October 1978.

The 1976 and 1977 air quality data for the Kenmore Square and Callahan Tunnel air quality stations indicated TSP levels in excess of primary and secondary standards for annual geometric mean. The 24-hour secondary standard was also exceeded.

The ERT study indicated, in the project vicinity, hourly CO levels do not exceed the one-hour national ambient air quality standards, but that the eight-hour CO levels occassionally exceed the eight-hour standards.

Ambient SO_2 and NO_2 standards were not exceeded at the two air quality stations. The ERT report indicated that since 1973 SO_2 concentration in the Boston Metropolitan Area have been consistently at levels that meet air quality standards.

Noise*

Noise levels are expressed in units of dBA (decibels on the A-weighted scale) and are found to be closely related to human-perceived noisiness and noise annoyance. Figure 4 shows some commonly experienced sound levels expressed in dBA. A difference of 3 dBA occurring over a period of more than a few minutes is thought by many acoustical specialists to represent a just noticeable difference. A 10 dBA increase in noise level represents a doubling of perceived noise.

Noise levels in the community fluctuate during the day and night. Generally, they are quieter at night than during the day when there is more activity. To describe the changing noise

*This information is based on analyses by L.G. Copley Associates.

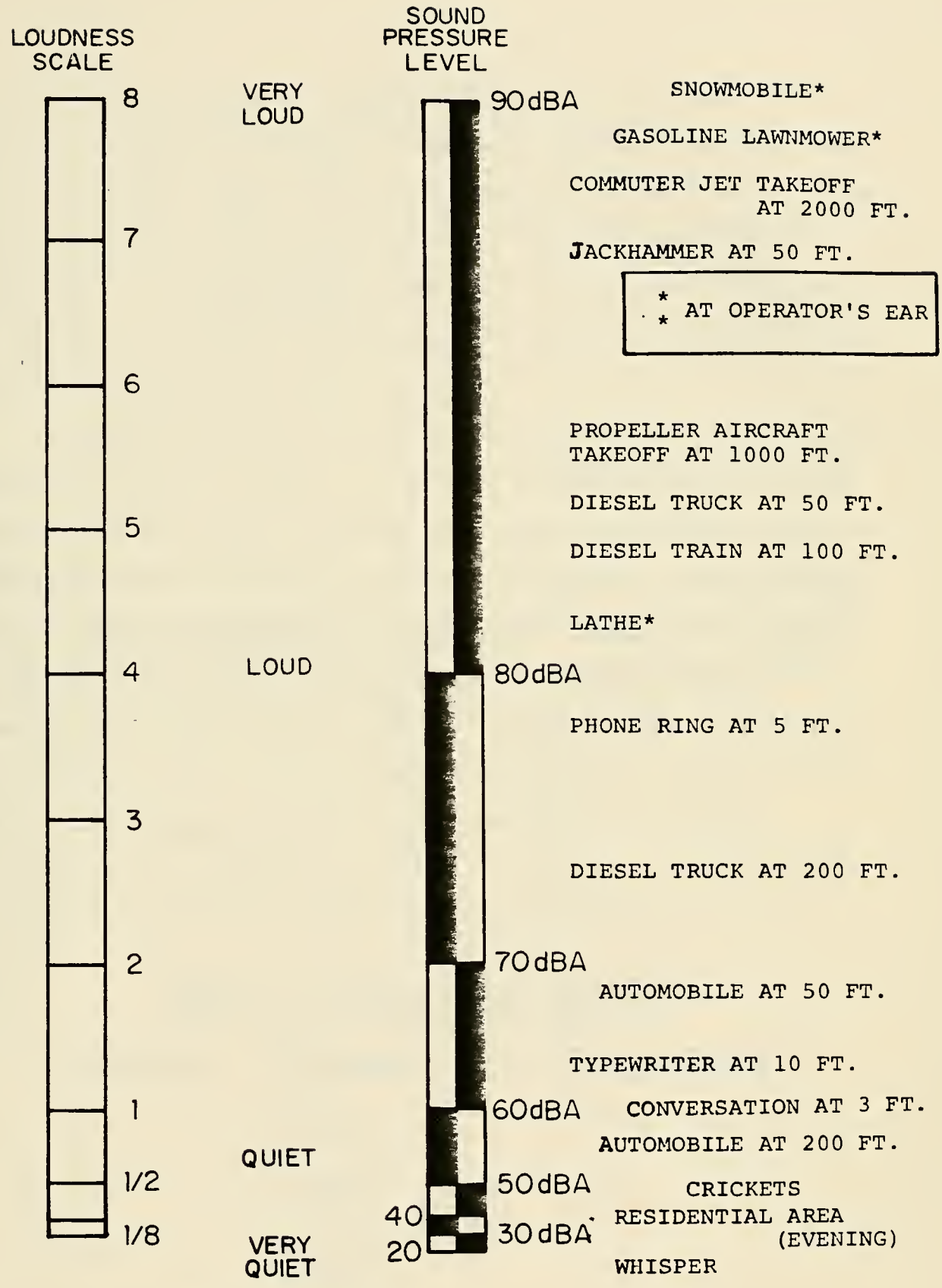


FIGURE 4

TYPICAL SOUND LEVELS IN DBA
AND THEIR SUBJECTIVE LOUDNESS.

levels, it is customary to employ some type of statistical analysis. This noise analysis considers L_{10} noise levels, where L_{10} is that noise level which is exceeded 10 percent of the time and is expressed in dBA. The L_{10} noise level is generally indicative of the higher noise levels occurring over the given time period. In urban communities, the L_{10} level indicates the character of localized traffic noise.

Noise measurements were conducted during the afternoons of February 4, 1975 and April 18, 1979 at representative sites in the area and are shown by square locations on Figure 5. The noise measurements conducted in 1975 (location A) were obtained from the Final Environmental Impact Report for the New England Medical Center Hospital's Facilities Development Program (ERT Document No. P-1433). The 1979 noise measurements (locations B and C) consist of 20-minute samples each using a General Radio 1945 Community Noise Analyzer. The results of the noise measurements are indicated on Table 5. It can be seen that L_{10} community noise levels fluctuate between 58 dBA and 67 dBA.

TABLE 5. EXISTING L_{10} NOISE LEVELS
NEAR U.S.D.A. NUTRITION CENTER SITE

Location(1)	Date/Time	L10 noise level, dBA
A	2/4/75 3:40 p.m.	67
B	4/18/79 3:00 p.m.	58
C	4/18/79 3:30 p.m.	61

1. See Figure 5.

FIGURE 5 NOISE RECEPTOR SITES AND NOISE MEASUREMENT LOCATIONS

Geology and Topography

In general, soil conditions for the site consist of 10 feet of fill, 60 feet of Boston blue clay, 10 feet of glacial till and then bedrock.

The most significant feature of the site topography is that it is man-made. As the previous locations of buildings and as the current location of a parking lot, the natural ground surface has been filled, excavated, graded, and covered with bituminous concrete. Site elevations range from 18 feet to 23 feet, based on the Boston City Datum (BCD) which is 5.65 feet below mean sea level. A topographic plan of the site was included in the tentative architectural submission to U.S.D.A., dated January 8, 1979.

Vegetation and Wildlife

There are no significant vegetative or wildlife resources on the site or in the immediate surrounding area.

Socioeconomic Characteristics

This section describes the existing socioeconomic environment for the project area and discusses the history and current neighborhood strategies for the area. The socioeconomic characteristics that will be described are population, housing, employment, and cultural factors such as language and ethnic identity of the predominantly Chinese community.

History. The USDA Human Nutrition Research Center site is located in the Chinatown - South Cove neighborhood, on land created in the early 1800's by the fillings of tidal flats on

both sides of Washington Street. Over the years, this land has been developed for residential and medical institutional uses.

Residential development of the South Cove began around 1830, and was characterized by native American, middle class residents. The expansion of the railroad network at South Station soon diminished the attractiveness of this neighborhood to these early residents, who began to move further away from the central city. The departure of the original residents opened South Cove property to successive waves of immigrants - Irish, Italian, Jewish, Syrian and finally Chinese in the late 1880's.

Until World War II, Chinatown - South Cove was a relatively self-contained community, with men employed as laborers and launderers, and women as stichers in the nearby Garment District. Acculturation did not readily occur because the Chinese suffered from a language barrier as well as cultural and racial discrimination.*

Gradually, first and second floors of small brick townhouses were converted to restaurants and shops that catered to the non-Chinese as well as the Chinese community. Upper floors continued to be used for dwelling units for Chinese families.

In the late 1950's the construction of the Massachusetts Turnpike and the Southeast Expressway in the Chinatown - South Cove area resulted in the demolition of approximately 700 housing

*Chinatown-South Cove District Profile and Proposed 1978-1980 Neighborhood Improvement Program, Boston Redevelopment Authority, 1977.

units and an increase in auto traffic in the area. Figures are not available on the ethnic composition of those displaced. Many of the displaced Chinese families, however, crowded into existing units in the South Cove area while others reluctantly moved to the South End, Mission Hill/Fenway and Allston/Brighton.* In 1965, the South Cove Urban Renewal Project resulted in further demolition of many housing units in the area.

The development of medical institutions in the South Cove also began in the early 1800's, when Dr. Oliver Wendell Holmes, a physician at the original Boston Dispensary, established a central outpatient clinic at the present location of Ash and Bennet Streets. Pioneering achievements of the Boston dispensary include:

- in 1821, the first central clinic opened to the poor;
- in 1899, the nation's first lung clinic for tuberculosis; and
- in 1918, the first Food Clinic in the nation, under the direction of Frances Stern.

Parallel to the development of adult services at the Dispensary were pediatric services at the Boston Floating Hospital for Infants and Children which was located on a boat in Boston Harbor. Daily trips in summer months combined medical treatment with relief from the crowded, airless tenements inhabited by central city Bostonians. In 1931, the Floating Hospital was

*Chinatown-South Cove District Profile and Proposed 1978-1980 Neighborhood Improvement Program, Boston Redevelopment Authority, 1977.

established in a permanent building on Ash Street next to the Dispensary, and the two clinical units were joined by Tufts Medical School in an unincorporated alliance which came to be known as the New England Medical Center. Its development was followed by establishment of the Joseph H. Pratt Diagnostic Hospital in 1938, and the Ziskind Research Building and the Farnsworth Surgical Building in 1949.*

Incorporation of the Tufts Medical and Dental Schools and the Boston Dispensary, Floating Hospital and Pratt Clinic to form a non-profit association, the Tufts New England Medical Center (Tufts-NEMC) occurred in 1968 after a long history of negotiation. Although there had been discussions of various types of integrated activities, it was not until 1960 that the first steps toward long-range planning and possible consolidation had been officially recommended. The Medical Center's development program was to be carried out within the framework of Boston's South Cove Urban Renewal Plan as executed by the Boston Redevelopment Authority.

In 1965, the South Cove Urban Renewal Project was initiated with its goal to provide for the orderly expansion of the Tufts-NEMC, to further the vitality of the entertainment district and to preserve two residential neighborhoods, Chinatown/South Cove and Bay Village, located west of Charles Street. The urban

*A Tradition of Concern, New England Medical Center Hospital, Draft No. 3, May 1979.

renewal project area was bounded by the Southeast Expressway, the Massachusetts Turnpike, Clarendon Street, Stuart Street, and Kneeland Street.

The physical and demographic changes that have resulted in the current neighborhood environment will be described in the following section.

Present Conditions - Population. Boston's Chinatown is the fourth largest "Chinatown" in the country.* In addition to being the place of residence for approximately 5,000 Chinese, it is the focal point for the Chinese community in Boston and New England. The current Chinese population in the Boston Standard Metropolitan Statistical Area is 8,000 to 12,000 people.**

The Chinatown residential community is only a portion of the South Cove Urban Renewal area. The residential community is bounded by the Expressway, Essex Street, Harrison Avenue, Kneeland Street, Tyler Street, Oak Street and the Turnpike. New housing developments such as Mass Pike Towers and Tai Tung Village have extended the Chinese residential area to the south, along Oak Street.

In the present population, about 25 percent of the people in Chinatown are elderly single male immigrants who speak little or no English. Many of these men emigrated from China with the

*Chinatown-South Cove District Profile and Proposed 1978-1980 Neighborhood Improvement Program, Boston Redevelopment Authority, 1977.

**Final Environmental Impact Report for the New England Medical Center Hospital Development Program, Environmental Research & Technology, 1975.

expectation of earning money for their families and then returning home. The closing of the mainland in 1949 meant that men who had planned to return were forced to stay. Now elderly, they are not receiving the care traditionally extended by Chinese families to their elderly.*

Since 1965, when the Immigration and Nationality Act was passed, the number of Chinese immigrants increased and the demographic mix began to change. The unskilled, undereducated adult male immigrant from rural communities were replaced by young men, women and children, a majority of whom had resided in densely populated urban areas, and many of whom were professionally and technically trained. Chinatown is growing by an estimated 300 to 500 persons per year.**

Present Conditions - Housing. The South Cove Urban Project resulted in the demolition of approximately 530 to 540 housing units in dilapidated and deteriorating three- to five- story row houses, which caused the displacement and relocation of much of the Chinese community to the South End, Mission Hill/Fenway and Allston/Brighton.*** The Project also resulted in the development of three HUD assisted public housing projects for the Chinese community. As shown in Table 6, Mass Pike Towers and Tai Tung Village contain a total of 414 family and elderly units. The

*Final Environmental Impact Report for the New England Medical Center Hospital Development Program, Environmental Research & Technology, 1975.

**Boston Phoenix Feb. 6, 1979 and interview with Selina Jung, Chinese Economic Development Commission, 21 May 1979.

***Joan Smith, Boston Redevelopment Authority, May 22, 1979.

third, Quincy Towers, has 161 units of housing for elderly and is located adjacent to the new Quincy Community School. In addition, 24 units of family housing were rehabilitated with assistance from the Massachusetts Housing Finance Agency. Other rehabilitation was undertaken with HUD Section 312 Rehabilitation Loans.

TABLE 6. HOUSING DEMOLITION AND NEW OR REHABILITATED UNITS SOUTH COVE URBAN RENEWAL PROJECT

	No. of units	Type of occupants	% Units occupied by Chinese
Demolitions	530-540(1)	Families and individuals	49
New construction	414	Families & elderly	77
	161	Elderly	60
Rehabilitation	24	Families	-

1. 572 families and individuals were relocated. Since some relocations split households, the number of units is between 530 and 540.

Source: Boston Redevelopment Authority
Management personnel at Mass Pike Towers, Quincy Towers, and Tai Tung Village.

The ever-increasing demand for units in the Chinese residential community and the low incomes which limit housing options for residents has resulted in a severe housing shortage. At present, there is a waiting list of 300 households for Mass Pike Towers, 300 households for Tai Tung Village and 475 households for Quincy Towers.*

*Information provided by management of Mass Pike Towers, Quincy Towers and Tai Tung Village. Since applicants can be on several waiting lists, there is likely to be duplication between lists.

Within Chinatown, an estimated 78 percent of the units are overcrowded as compared with a citywide figure of 8 percent. Housing stock quality is also a problem since 72 percent of Chinatown's housing units were considered deteriorated or dilapidated in 1969, compared with the citywide figure of 14 percent.* Although over 600 new units have been constructed since 1969, existing units continue to deteriorate because little rehabilitation has occurred.

Chinese community groups and the BRA are working on housing strategies to meet the housing demand. At the present time, there are plans for 150 units of elderly housing on Stuart Street near Bay Village and 80 units to be constructed adjacent to the Bradford Hotel.** These units are intended for elderly persons in the Chinese community.

Employment and Cultural Factors. The major employer in the Chinatown/South Cove area is Tufts-NEMC. The Tufts-NEMC complex employs approximately 4,500 persons in a variety of job categories. As shown in Table 7, most of the workers are professional or clerical. Forty-one percent of the Tufts-NEMC employees are from the City of Boston and 93 percent are from the Boston SMSA.*** Twenty-one percent of the employees are members of minority groups as defined by Federal affirmative action guidelines.

*Chinatown-South Cove District Profile and Proposed 1978-1980 Neighborhood Improvement Program, Boston Redevelopment Authority, 1977.
**Interview with Arthur Reilly, BRA, May 21, 1979.
***Interview with Henry Wilson, Director of Public Relations, Tufts-New England Medical Center, May 22, 1979.

TABLE 7. EMPLOYMENT AT THE TUFTS-NEW ENGLAND MEDICAL CENTER, 1978-1979

Type of position	Percent of total
Professional	43
Clerical	20
Service	16
Technician	11
Crafts and tradesmen	4
Administration	4
Other	2
	100

Source: Tufts-NEMC.

The restaurant industry is the major employer of men in the Chinese community with 42 percent of the entire labor force working as waiters, cooks, and general help.* Many women in the Chinese community are employed as stitchers in the garment industry, but since the garment industry is declining, it can not be relied upon for increasing job opportunities.

Many of the immigrants arriving in the Boston area are underemployed because of their inability to speak English, even though their education and training may qualify them for better jobs. Limited to entry level positions with long hours at minimal pay, participation in language classes is difficult, so upward mobility is limited.

The Chinese Economic Development Council (CEDC) has been assisting members of the Chinese community in the establishment

*Chinatown-South Cove District Profile and Proposed 1978-1980 Neighborhood Improvement Program, Boston Redevelopment Authority, 1977.

and management of diversified businesses that will expand employment opportunities for community residents. They are interested in working with the private sector to provide on-the-job training programs and encouraging area developments such as Lafayette - Jordan Marsh and Park Plaza to draw on local labor supply.

CHAPTER 3

PROBABLE ENVIRONMENTAL IMPACTS

This chapter evaluates the probable environmental impacts of the proposed Human Nutrition Research Center. Impacts from both the operation of the facility and its construction are considered. The analysis considers land use, transportation, aesthetics, infrastructure, water quality, air quality, noise, geology, vegetation and wildlife, socioeconomic and cumulative impacts.

Land Use

The proposed Center is being developed as part of the South Cove Urban Renewal Project. The site is designated in the "South Cove Urban Renewal Plan" for hospital uses. The Nutrition Center is compatible with that land use designation. The Center is also compatible with the immediate surrounding land uses of the Tufts-NEMC area complex, the theatre district, and the commercial and office uses of Stuart Street.

The overall impact of the Center on land uses in this area is considered to be beneficial. The Center will be eliminating surface parking and be providing in its place a new modern research facility which complements the present uses in the area.

Transportation

Trip Generation. The Human Nutrition Research Center will generate 600 trips per day. Of these, it is estimated that 252 are vehicle trips, 318 are mass transit trips, and 30 are

pedestrian trips. Table 8 shows the estimated trip generation. Due to the nature of the work performed in the building, the Center is a low trip generator in comparison to other research and office uses.

TABLE 8. TRIP GENERATION

Generator	24-hour total mode trips	Mode		
		Vehicle	Mass transit	Pedestrian
238 employees	466(1)	194(1)	254(2)	18(2)
40 patients	80	20	60	0
5 visitors	10	4	4	2
7 deliveries	14	14	0	0
Other	30	20	0	10
Total	600	252	318	30

1. Employee vehicle trips are based on a 1.3 occupancy rate for trips to and from work. Some miscellaneous trips are also included.
2. Employee mass transit and pedestrian trips include trips to and from work and some miscellaneous work-related trips.

Source: Metcalf & Eddy, Inc.

Employees of the Center comprise the bulk of these trips. A value of 40 percent was used to estimate the number of employees who would drive rather than use other modes of transportation, excluding pedestrians. This 40 percent value was derived from data on various buildings in the downtown area as well as the Boston Parking Study, 1974. This latter study estimated that 60 percent of the daytime population used public transportation to enter the downtown area of Boston.

Traffic and Parking. The Center will not be providing on-site parking. However, employee parking will be available at

"reduced" rates from the Tufts parking garage (930 capacity) almost adjacent to the site and at the newly rented Tufts garage on Shawmut Avenue and Herald Street (400 car capacity). This latter garage will charge only $1.50 for all day parking as compared to $2.00 at the garage adjacent to the site. Monthly rates are $25.00 for the Herald Street garage and $40.00 for the garage adjacent to the site.

The 238 new vehicle trips* plus the 660 vehicle trips that currently use the parking lot on the site mean that a total of 898 vehicle trips (449 cars) will need new parking arrangements. During the day, 280 of these trips (140 cars) can be accommodated by the Tufts garage adjacent to the site. In addition, all of the nighttime trips (180 vehicle trips or 90 cars) can be accommodated by that garage. These 460 vehicle trips are fewer than the 660 trips generated by the existing parking lots on the site. Because of the heavy existing traffic volumes, this difference will not significantly affect traffic flow in the immediate vicinity of this location.

The 438 trips (219 cars) who cannot be accommodated in the adjacent Tufts garage will have to find other parking arrangements. Many of them should find the Herald Street garage attractive because parking there is cheaper than at other locations (a $25 monthly rate for Tufts-NEMCH versus at least $50 at non-Tufts

*Excludes 14 delivery vehicle trips and does not consider the use of taxis. Use of taxis reduces vehicle trips and parking demand. Taxi use for this facility is not considered to be significant.

facilities). Those who feel that the walk from the Herald Street garage is too long or the location of the garage is inconvenient, can find parking in a number of other nearby garages (see Table 2). These additional vehicle trips to other garages should not significantly affect the street system in these other areas.

It is recognized that in the site vicinity, other parking spaces besides those directly on the U.S.D.A. site will be eliminated. This will create additional demand for parking beyond that described above. To the extent that demand may eventually exceed supply, employees who usually drive may decide to use public transportation or to carpool. This impact is consistent with the parking freeze in Boston Proper which is designed to reduce vehicle-miles-traveled by not providing new parking spaces.

The U.S.D.A. will encourage the practice of carpooling and employees of the U.S.D.A. will be eligible for the MBTA pass program.

Public Transportation. The 318 public transportation trips should have a negligible impact on the system. The new Orange Line, with a station at the Tufts-New England Medical Center area, is being designed to accommodate demand from the area.

Service Requirements. It should be mentioned that as part of the South Cove Project, an enclosed private service road will extend from Stuart Street to Washington Street through the Nutrition Center Building and the new NEMCH addition. This road

will carry service vehicles for the Music Hall, the Nutrition Center, the NEMCH, and Don Bosco High School. The road is intended to provide off-street loading for these buildings and keep service vehicles from backing up onto Stuart Street or Washington Street.

Construction. During construction there will be additional truck traffic in this area. This is a short-term adverse impact. The construction manager has indicated that to minimize this impact, he will confine truck routes to Kneeland Street to the Expressway.

There will also be construction workers who will be driving to the site. This impact is considered minimal, as experience with 60 State Street indicates that approximately 75 percent of the construction workers take public transportation and of the remaining 25 percent, carpooling is prevalent. Construction workers will be encouraged to park at the Herald Street garage.

Aesthetics

The Nutrition Center is being designed by Shepley Bulfinch/ Desmond and Lord to be harmonious in size, physical proportion, scale and materials with those buildings of the Tufts-NEMC area. Across Stuart Street the buildings are typically smaller and older. The building is also being designed to be compatible with these latter buildings. The BRA is coordinating this effort and is exercising review and approval rights with regard to design of this project.

Construction of the project will not involve demolition of any buildings, historic or otherwise. Similarly, construction of the project should not affect archaeological sites because there are no reported archaeological sites in the project location and the site has been previously disturbed.

Infrastructure and Water Quality

Utilities and Water Quality. The proposed project will generate 21,000 gallons per day of sewage. There will be some acid wastes generated by the laboratories. These wastes will be treated by a marble chips neutralization tank prior to discharge of the wastes into the sewer system. The sewage will enter a 24-inch by 30-inch sanitary sewer in Stuart Street (to be separated as part of the Park Plaza Improvements) and a 42-inch combined sewer in Washington Street. The sewage will flow in combined sewers to the East Side Interceptor and out to the Deer Island Treatment Facility. The outfall where the effluent is discharged from the Deer Island Facility is located in the Boston Harbor. A study by MDC is evaluating impacts of the discharged effluent on water quality and aquatic biota to determine if further treatment or relocation of the outfall is needed. Because of the minimal amount of sewage generated, the project will have a negligible impact on the operation and performance of the Deer Island facility and on the East Side Interceptor. As noted previously, the East Side Interceptor is overloaded and scheduled for replacement. Design for the new interceptor will begin in May, 1979 and last two years; construction will take three years.

Until the East Side Interceptor is completed, the Nutrition Center may contribute to existing dry weather overflows to the Fort Point. Since the water quality in the Fort Point Channel is very poor, these overflows should not degrade it further.

The project site is presently a paved parking lot. Therefore, stormwater runoff from the site will not measurably increase due to the Nutrition Center. However, during wet weather the additional sewage generated by the facility will add to the wet weather flows, which presently overflow at the Fort Point Channel. This addition is small and should have a minimal impact on overflows and water quality of the Fort Point Channel. In addition, the MDC Combined Sewer Overflow Study is currently addressing the problem of combined sewer overflows and will be proposing solutions.

Due to the project, an existing 12-inch sanitary sewer in Dore Street will need to be replaced. A task force of the involved parties are studying where and how this sewer should be replaced.

Water consumption for the Center is estimated as shown in Table 9. The Center will connect to a 16-inch main in Washington Street. The main has adequate capacity to service the Center.

The City receives its water from the MDC which brings in the water by gravity flow from the Quabbin and Wachusett Reservoirs. The water is soft and of good quality. The City uses

approximately 143 mgd.* The Center's use of 40,000 gallons per day will have a negligible impact on the City's water use and on the City's water supply.

TABLE 9. ESTIMATED WATER CONSUMPTION

Use	Gallons per day
Employees	3,570
Volunteers	1,540
Swimming pool	280
Equipment and labs	15,610
Cooling tower (during 3 months of operation)	19,000
Total	40,000

Source: Robert W. Sullivan, Inc.

During construction there will be no disruption of utility service.

Energy.** An oil-fueled boiler system will be used to heat the facility. Air conditioning will be provided by two electric centrifugal chillers located on the 10th floor and a cooling tower located on the 14th floor.

Estimated annual fuel consumption is:

- 250,000 gallons of Number 2 oil for the heating system;
- 1,000,000 KW of electricity per year for the building's chiller, cooling tower and associated pumps.

*As of 1978.
**Based on information from Scorziello Associates, Inc.

In addition to the above, there will be a connected HVAC load of 80 hp (horsepower) for the heating pumps and boiler burner motors and 263 hp for fans and miscellaneous items.

Electricity for the Nutrition Center will come from the Boston Edison main generating facility in South Boston.

The project has been designed to minimize energy consumption. Among the energy-reducing provisions are heat recovery run-around coils in the exhaust air stream for the animal levels and two of the laboratory units, economy cycle operation for air handling units, variable volume systems for vane axial pitch fans, and possibly double bundle condensers on the chillers.

Solid Waste. The Center will generate approximately 3,800 cubic yards per year of domestic type waste. Management systems for handling waste are being explored. It is likely, however, that the Center will have a compactor to compact the waste. It will then be hauled away by an authorized commercial disposal service to a permitted or licensed landfill site or an energy recovery facility.

There may be a limited quantity of low level radioactive wastes. These would be disposed of by a licensed disposal contractor, who would dispose of the wastes in accordance with applicable standards. This procedures is described in the section on chemical and radioactive wastes.

There may also be some animal wastes generated by animals who die naturally or are sacrificed for research purposes while at the Center. Methods for disposal of these wastes are still being investigated. One possibility is incineration at the Tufts Veterinary School in Grafton, Massachusetts.

Air Quality

Vehicular Emissions. The proposed project should result in fewer vehicle trips to the site vicinity than currently generated by the existing parking lot. The project should not, therefore, increase vehicular emissions or worsen air quality in the immediate site vicinity.

The number of vehicle trips relocated to other parking garages in the area is small compared to the total traffic volumes on the street network in this area. These additional trips should, therefore, have a negligible impact on air quality.

Stack Emissions.* The building will have hot water to heat the building, hot water for domestic use, hot water for space temperature control and steam for equipment within it provided by oil-burning boilers. The stack from the boilers will discharge at a minimum of 10 feet above the high point of the roof. The estimated annual fuel consumption is 200,000 to 250,000 gallons.

The State DEQE is currently reviewing the plans of the facility. They will review the types of fuel to be used, the

*Based on information from Scorziello Associates, Inc.

sulfur content and ash content of the fuels, the location of the discharge outlet and the type of fuel-burning equipment that is to be used to determine that the facility complies with their regulations. The DEQE will model the facility by computer to determine if the stack height is sufficient to provide dispersion and if the oil-burning equipment is designed to meet their requirements. The DEQE must approve the plans before the facility can be operated.

The types of fuel that the facility is designed to use are No. 2, 4 and 5 fuel oil. State law requires that the sulfur content of No. 2 oil not exceed 0.3 percent by weight and that No. 4 and 5 not exceed 0.5 percent by weight. These are the values around which the facility was designed. Typically, the oil will have a sulfur content below these figures as evidenced by the fact that No. 4 oil has lately been sold with a sulfur level below 0.4 percent. Sulfur is the principal item which the DEQE is concerned with. The DEQE, in modeling the building, will check the boiler installation to assure that the SO_2 level at grade, at all fresh air intake louvers and at any other areas they feel are critical points does not exceed 0.14 ppm (parts per million) average over a 24-hour period or 0.05 ppm average over a three-hour period. These levels include background SO_2 levels from all other sources in the area as well as the Nutrition Laboratory. Therefore, the added SO_2 plus the background SO_2 must not exceed these levels.

The ash content may not exceed 9 percent by weight. The submittal to DEQE lists the maximum ash content for oil to be burned as 0.3 percent. The actual ash content of No. 2 oil is of the trace, below measurable level, and of No. 4 and 5 oils, it has not been exceeding 0.02 percent according to local suppliers.

The particulate level according to the submittal and State guidelines may not exceed 0.1 pounds per million Btu (British thermal units) per hour input.

The facility will have three 200-hp boiler units, only two of which would operate at even the highest load condition. A smoke density indicator, recorder and alarm will be provided. If the level of smoke discharged by the boilers rises above the State requirement levels, the alarm will sound and the operating personnel are required to take corrective action. Visible emissions from the stack must be within the levels of Charts 1 and 2 as documented at the DEQE. These charts, available at DEQE, specify the maximum smoke shade, density and appearance. The level is monitored by the device previously noted and by visual means. If the level is exceeded, the State requires that corrective action be taken.

The State DEQE requires that yearly inspections and maintenance be performed on the facility and that records of both be kept. This facility will be maintained by trained personnel 24 hours a day and maintenance will be performed on a regular basis.

It should be noted that during the winter season, the boilers will rarely operate at full capacity and, therefore, at

the full emission rate. Typically, the facility will operate at the 70 percent level or lower. It should also be noted that during the summer, the facility will operate at a maximum of 40 percent of its full rating with the typical level being below 20 percent.

The facility will produce all the hot water or steam required by the building. The facility will be efficient in operation and it is not designed for connection at a future date to a central boiler facility at a remote location. The facility will not impose any load on the existing Boston Edison facility on Stuart Street which distributes steam to other buldings in the area.

Exhaust System.* The exhaust system for the building has been designed with consideration to the different functions within the building. The exhaust air from both levels (levels 3 and 4) where animals are housed will be discharged at the roof at approximately the same elevations as the top of the boiler stack. Animal hair entrained in the air stream will be removed by filters before the air is exhausted. The air will not create an odor problem for the area. The principal odor in animal housing is ammonia created by the animal waste products. The animal bedding will be removed and replaced regularly, at least three times a week, and this will provide for removal of the odor with the bedding. Replacing the bedding frequently lessens the degree

*Based on information from Scorziello Associates, Inc.

to which the odors escape into the room air. Since the animals are sensitive and the experiments require they be kept healthy, the cleaning procedures noted will be closely adhered to.

The two animal floors in the building will basically be used to house animals that will require protection from the outside environment to provide reliable test data. Where studies are performed requiring isolation of the animals from the workers in the space, the animals will be housed in a separate biological cabinet within the animal room. Agents that will be carried into the levels' exhaust air that require filtration or incineration (such as the radioisotopes) will have the treatment procedure performed locally at the cabinet. Any incineration would involve a low cfm (cubic foot per minute) per cabinet air quantity and would be performed electrically. Typically, the work performed on these levels would not require any treatment of air except for a maximum of 18 percent of the level 3 and 4 floor area rooms.

The laboratory areas (levels 5 to 8) contain typical research laboratories and equipment required for the study of human nutrition. Typically, filtration or treatment of the exhaust air from the area is not required. All air supplied to laboratory space is exhausted either through a laboratory fume hood in the space or a combination of a hood and ceiling-grilled exhaust connected together above the laboratory ceiling. The ducts discharge at the roof above the air envelope of the building.

Specialized exhausts that cannot be combined with other exhausts will be exhausted through individual fan-duct systems. These specialized exhausts are the percholoric acid hoods and solvent hoods. To protect the ductwork and mechanical equipment, the air from the perchloric hood is passed through a water scrubber to remove the perchloric acid.

The emissions from the animal housing and laboratory levels will be reviewed by the State Public Health Department, Environmental Control Division.

Construction. During construction, particularly excavation, fugitive dust will be generated. Because much of the excavation work is below the water table, to some extent, this impact will be naturally reduced. Appropriate construction practices will be undertaken by the construction manager to prevent fugitive dust from becoming airborne. These measures include sweeping exit areas from the site, wetting construction areas and covering loads leaving the site.

Noise*

When the Center is operational, the Center should not affect noise levels in the area. The facility has been designed to minimize possible noise impacts during operation. Measures include placement of mechanical equipment on the roof. This will be above the surrounding buildings. Traffic noise generated by the facility is also not considered a problem. As indicated, the facility should reduce traffic in the area.

*All information on construction noise is based on analyses by L.G. Copley Associates.

During construction, there will be a significant adverse short-term noise impact. This section discusses that impact in detail.

Noise Criteria. The City of Boston Air Pollution Control Commission has restricted noise emitted from construction sites to levels shown in Table 10. It should be noted that impact devices such as pile drivers are exempt from this ordinance although they are the noisiest of the equipment types used in this construction project.

TABLE 10. SUMMARY OF CITY OF BOSTON CONSTRUCTION NOISE LIMITS

Lot use of affected property	L10 noise level at lot line	Maximum noise level
Residential/ institutional	75 dBA	86 dBA
Business or office	80 dBA	

Construction Schedule and Noise Emission of Construction Equipment. Information on construction activity is summarized in Table 11. Construction activity may be assumed to take place between 8:00 a.m. and 4:30 p.m. during weekdays.

Table 12 shows the expected maximum noise emission levels from different categories of construction equipment based on 1973 General Services Administration (GSA) specifications. It is expected that all equipment will at least comply with these maximum noise levels. If it does not, the Engineer may require

TABLE 11. CONSTRUCTION SCHEDULE AND ACTIVITY ASSUMPTIONS - U.S.D.A. HUMAN NUTRITION RESEARCH CENTER

Period (working days)	Construction phase	Expected major equipment activity, including average truckload per day (maximum)(1)	Number of working days used (five workdays per week)
7/20/79 - 11/5/79 (75)	Excavation including sheet piling (18,000 cu yds)	1 front-end loader	20
		1 backhoe	20
		1 pile driver	20
		16 truckloads (80)	75
11/7/79 - 12/19/79 (20)	Pile driving (column piling)	1 pile driver	20
		2 truckloads (10)	20
12/5/79 - 12/19/79 (20)	Pile driving and foundations	1 pile driver	10
		4 truckloads (10)	10
12/19/79 - 2/14/80 (40)	Foundations (concrete pouring)	3 truckloads (30)	40
2/14/80 - 4/21/80 (45)	Foundations and structural	1 crane	10
		2 derricks	36
		Pneumatic impact wrenches	45
		4 truckloads	45
4/21/80 - 5/23/80 (24)	Structural (steel erection)	1 crane	6
		2 derricks	21
		Pneumatic impact wrenches	25
		1 truckload	25
5/23/80 - 6/24/80 (20)	Structural and exterior wall (concrete fill)	1 crane	6
		2 derricks	20
		Pneumatic impact wrenches	20
		1 material hoist	20
		1 personnel hoist	20
		6 truckloads	20
6/24/80 - 8/6/80 (30)	Exterior wall	1 material hoist	30
		1 personnel hoist	30
		5 truckloads	30

TABLE 11 (Continued). CONSTRUCTION SCHEDULE AND ACTIVITY ASSUMPTIONS - U.S.D.A. HUMAN NUTRITION RESEARCH CENTER

Period (working days)	Construction phase	Expected major equipment activity, including average truckload per day (maximum)(1)	Number of working days used (five workdays per week)
8/6/80 - 9/11/80 (25)	Exterior wall and interior finish	1 material hoist	25
		1 personnel hoist	25
		6 truckloads	25
9/11/80 - 11/4/81 (280)	Interior	2 truckloads	280
		Miscellaneous drills and saws, etc.	280

1. Numbers in parentheses indicate peak number per day.

TABLE 12. MAXIMUM EXPECTED NOISE LEVELS EMITTED BY DIFFERENT CONSTRUCTION EQUIPMENT

Equipment type	Noise emission, dBA at 50 ft
Front-end loader	80
Backhoe	85
Piledriver	100
Crane	86
Derrick	88
Pneumatic impact wrench	86
Truck (stationary)	84
Truck (moving)	90
Material hoist	80
Personnel hoist	80

Source: 1973 GSA specifications.

the contractor to remove the equipment from the site and use alternate equipment.

Calculated Noise Levels. Construction noise can be considered to arise from two categories of source:

1. "Fixed" sources - within the confines of the site;
2. Mobile sources - haul trucks proceeding through the community.

Table 13 shows the calculated construction noise contribution due to "fixed sources at the construction site during the different phases of construction listed in Table 11. These combined noise levels are for a distance of 50 feet from the construction site boundary. The noise contribution at other distances is calculated using these 50-foot noise levels as a bases. In conformance with City of Boston noise regulations, the noise forecasts are expressed in terms of L_{10}, the noise level exceeded 10 percent of the time, i.e., six minutes per hour.

The forecast L_{10} noise levels for moving trucks during all phases of construction are less than 70 dBA at 50 feet. However, since the truck noise is significantly annoying, it is recommended that trucks be required to avoid driving through sensitive neighborhoods. This is especially true during the excavation stage when the greatest number of trucks will pass through the site daily.

Figure 5 shows the receptor sites for which construction noise forecasts were prepared. Figures 6 through 12 show the construction forecasts at these key locations around the

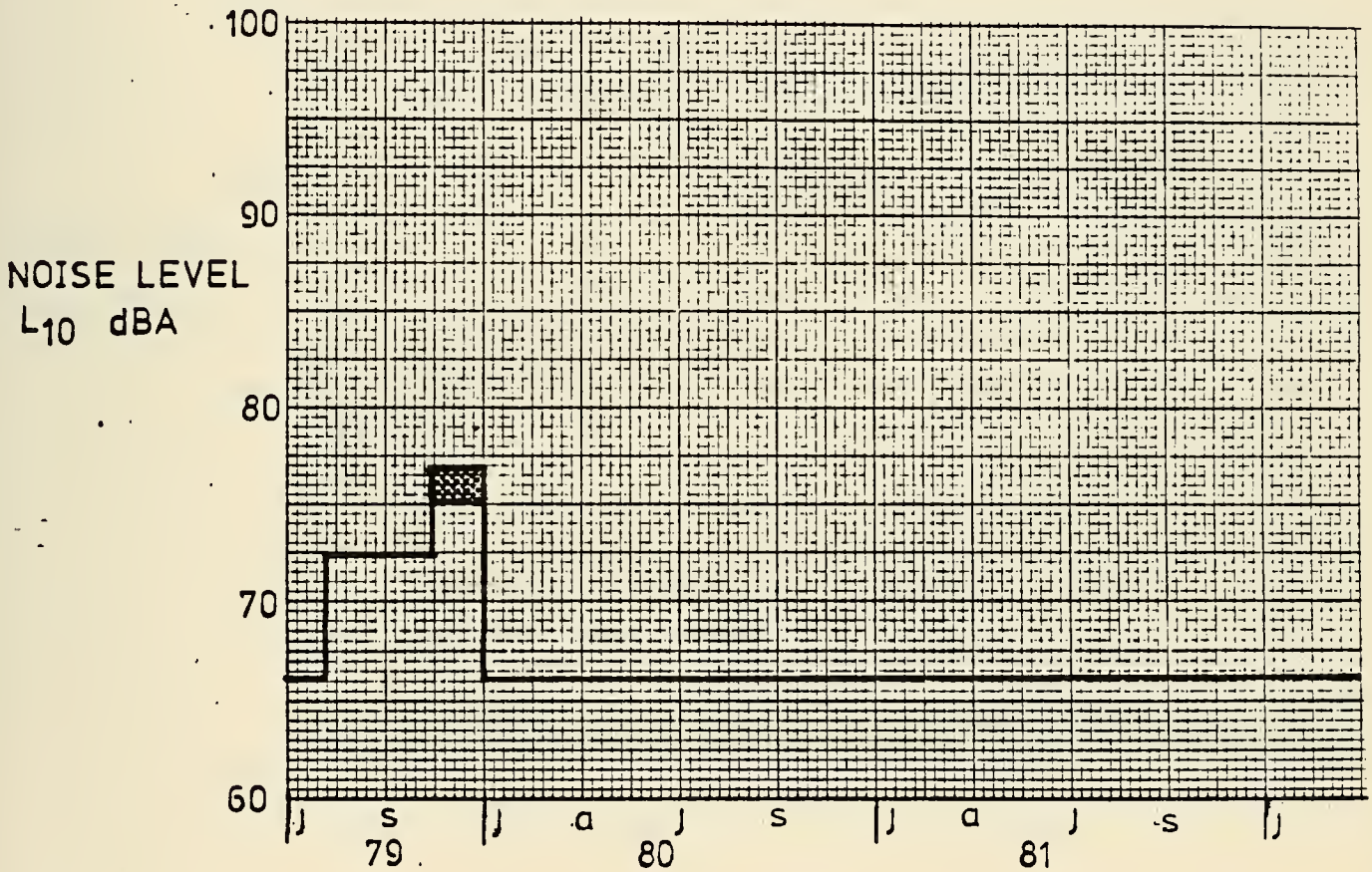
TABLE 13. COMBINED NOISE EMISSIONS FROM "FIXED" SOURCES AT U.S.D.A. SITE AT A DISTANCE OF 50 FEET(1) (Preliminary)

Period	Constructon phase	Construction noise level dBA L10 at 50 ft
7/20/79 - 11/5/79	Excavation	96
11/5/79 - 12/5/79	Pile driving	100
12/5/79 - 12/19/79	Pile driving and foundations	100
12/19/79 - 2/14/80	Foundations	83
2/14/80 - 4/21/80	Foundations and structural	89
4/21/80 - 5/23/80	Structural	89
5/23/80 - 6/24/80	Structural and exterior wall	83
6/24/80 - 8/6/80	Exterior wall	83
8/6/80 - 9/11/80	Exterior wall and interior finish	83
9/11/80 - 11/4/81	Interior wall	80

1. 8:00 a.m. to 4:30 p.m. weekdays)

USDA NUTRITION CENTER

Construction Noise Forecast



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617 965-5370

FIGURE 6 RECEPTOR #1: QUINCY TOWERS
700' FROM SITE

USDA NUTRITION CENTER

Construction Noise Forecast

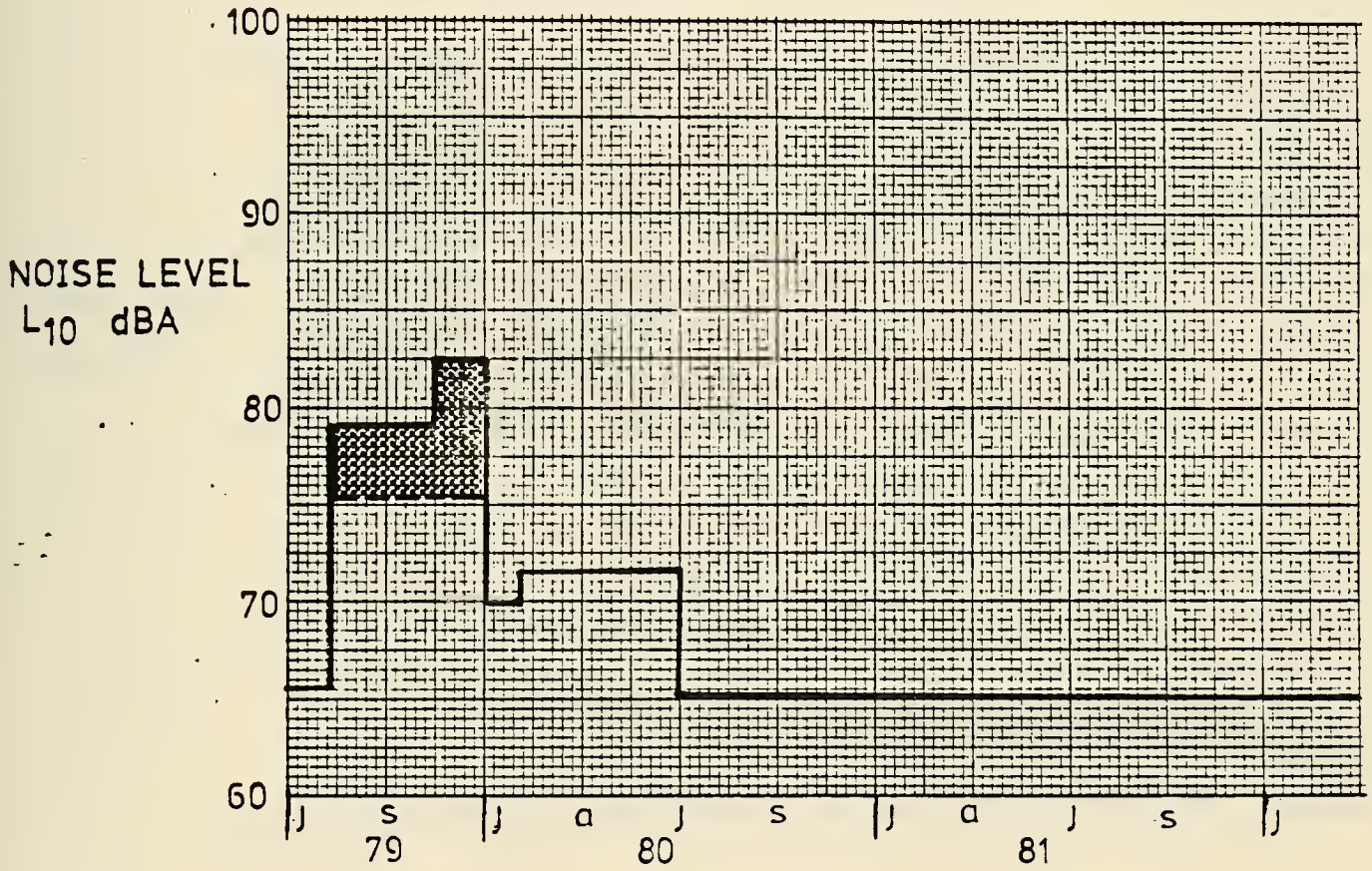

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FIGURE 7 RECEPTOR #2: DON BOSCO SCHOOL
300' FROM SITE

USDA NUTRITION CENTER

Construction Noise Forecast

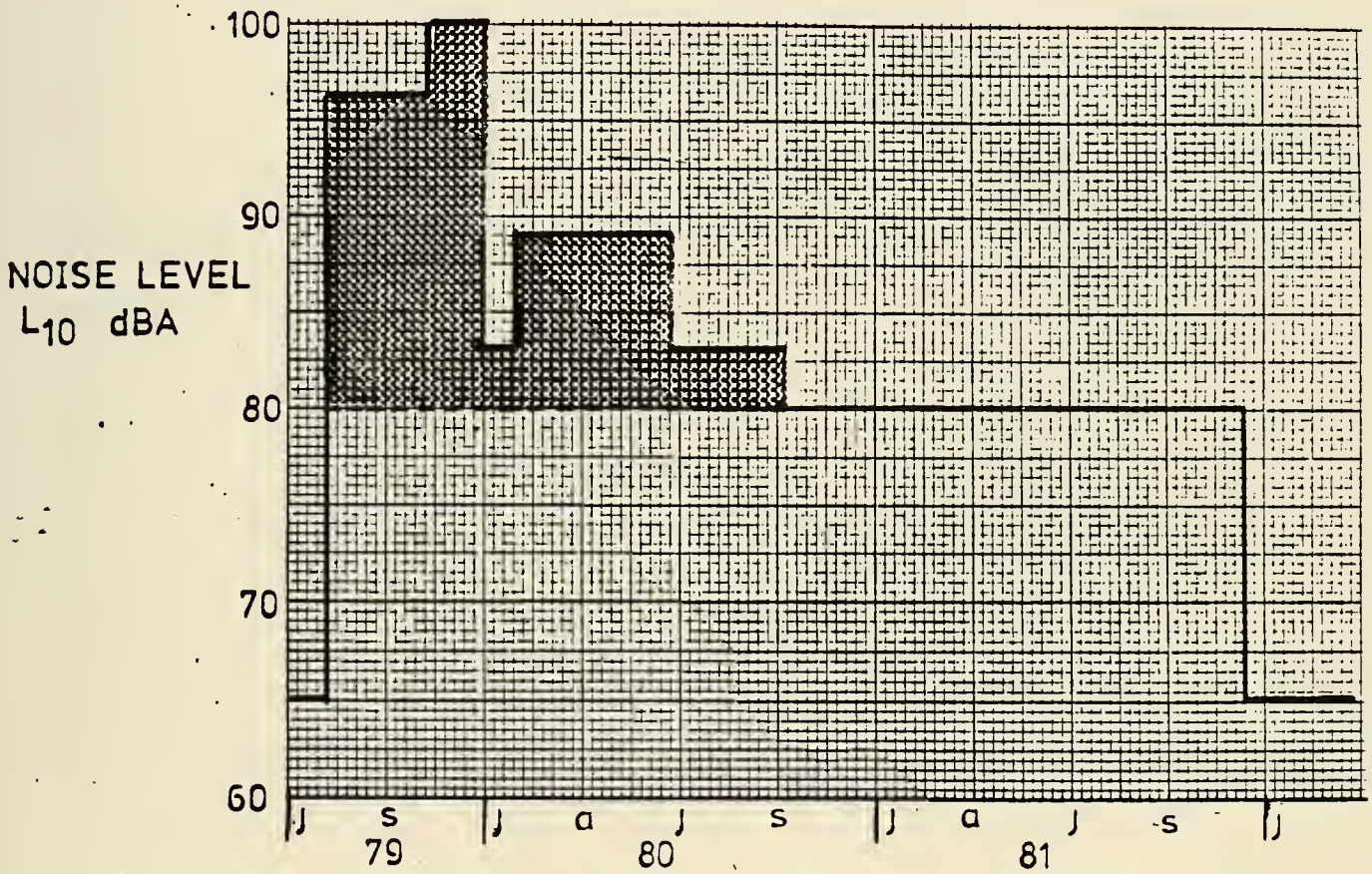

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FIGURE 8 RECEPTOR #3: MUSIC HALL REAR WALL 50' FROM SITE

USDA NUTRITION CENTER

Construction Noise Forecast

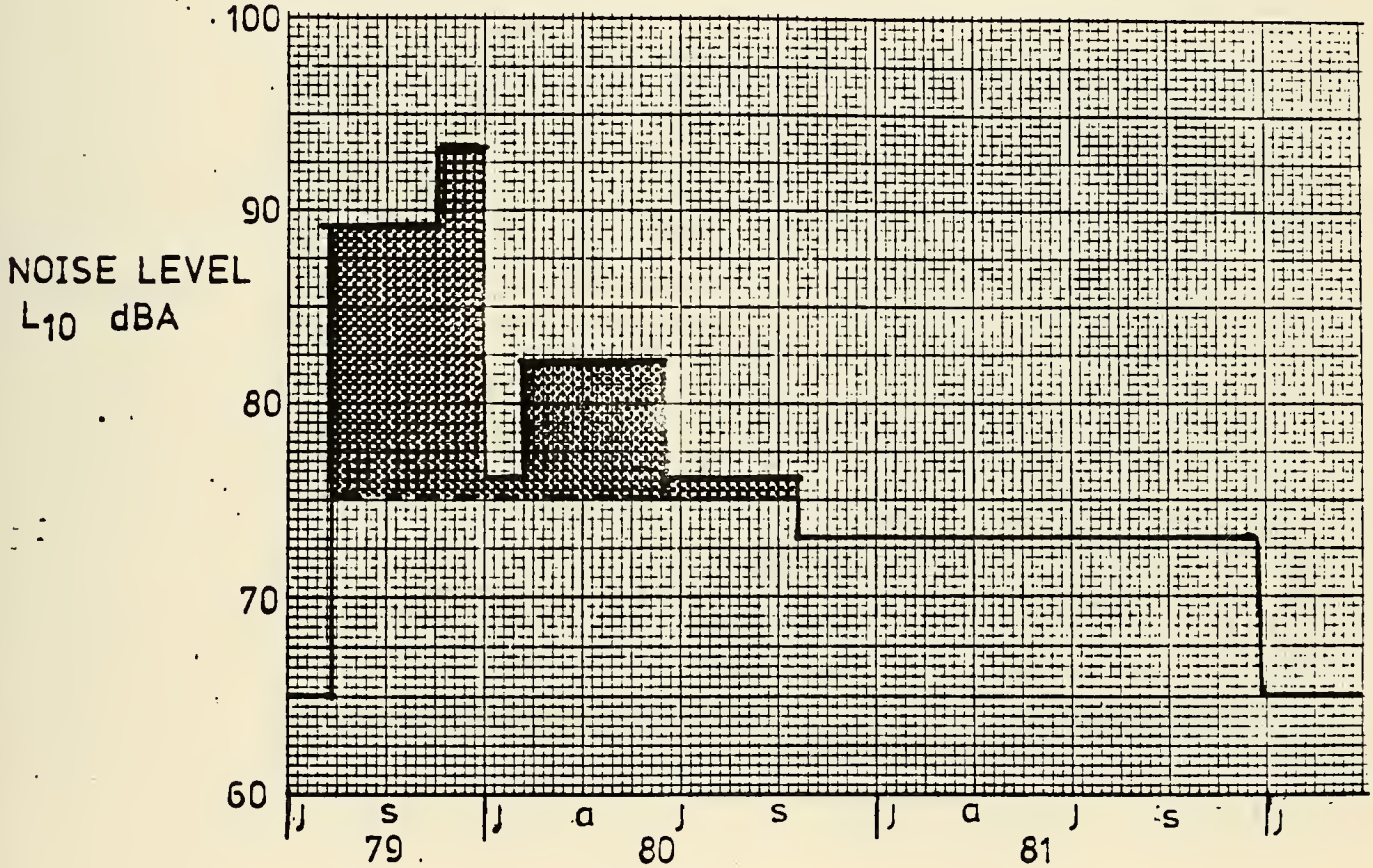

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FIGURE 9 RECEPTOR #4: TUFTS DENTAL HEALTH SCIENCES
100' FROM SITE

USDA NUTRITION CENTER

Construction Noise Forecast

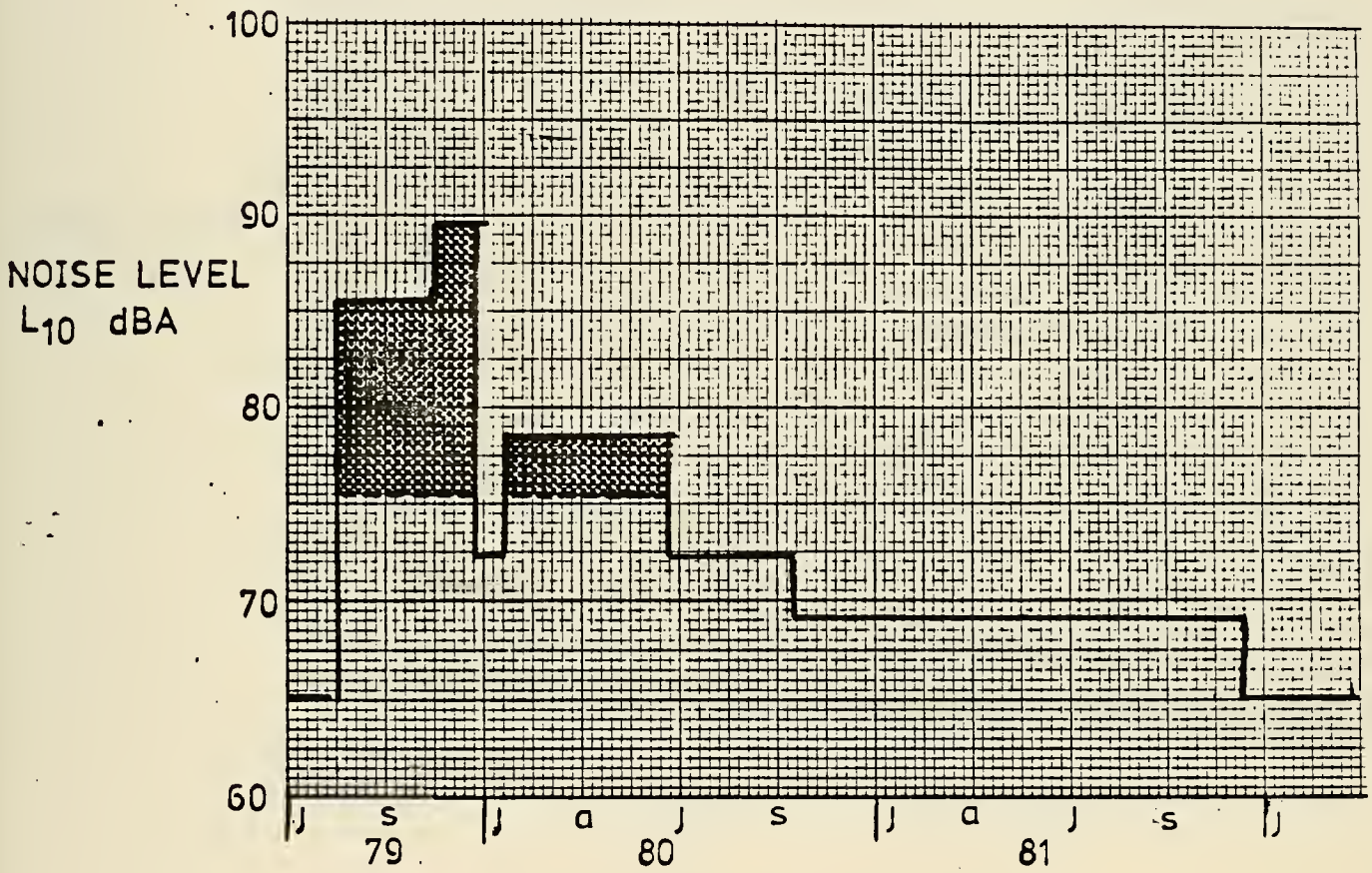

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FIGURE 10 RECEPTOR #5: PROGER BUILDING
170' FROM SITE

USDA NUTRITION CENTER

Construction Noise Forecast

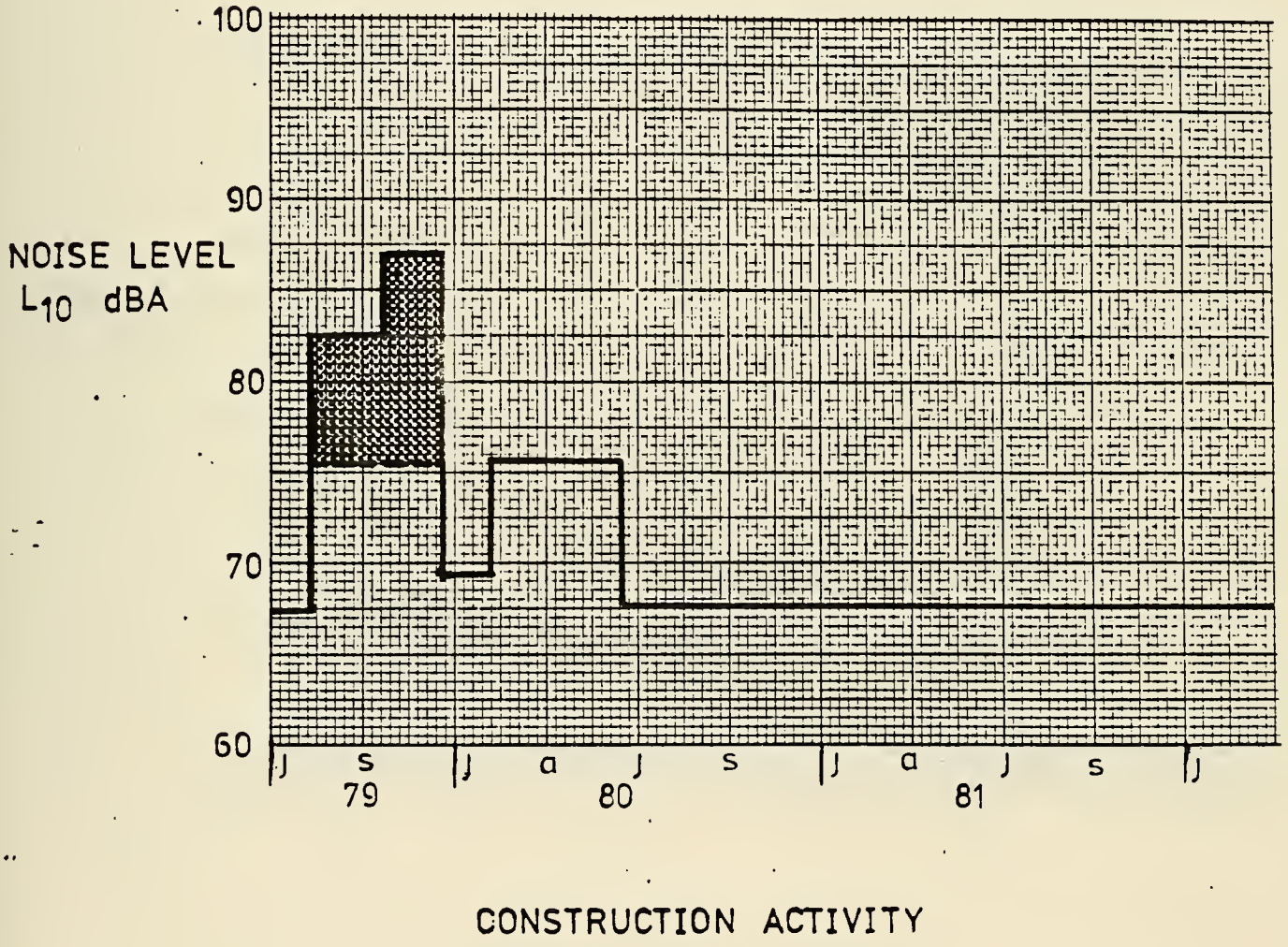

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FIGURE 11 RECEPTOR #6: BOSTON FLOATING HOSPITAL
500' FROM SITE

USDA NUTRITION CENTER

Construction Noise Forecast

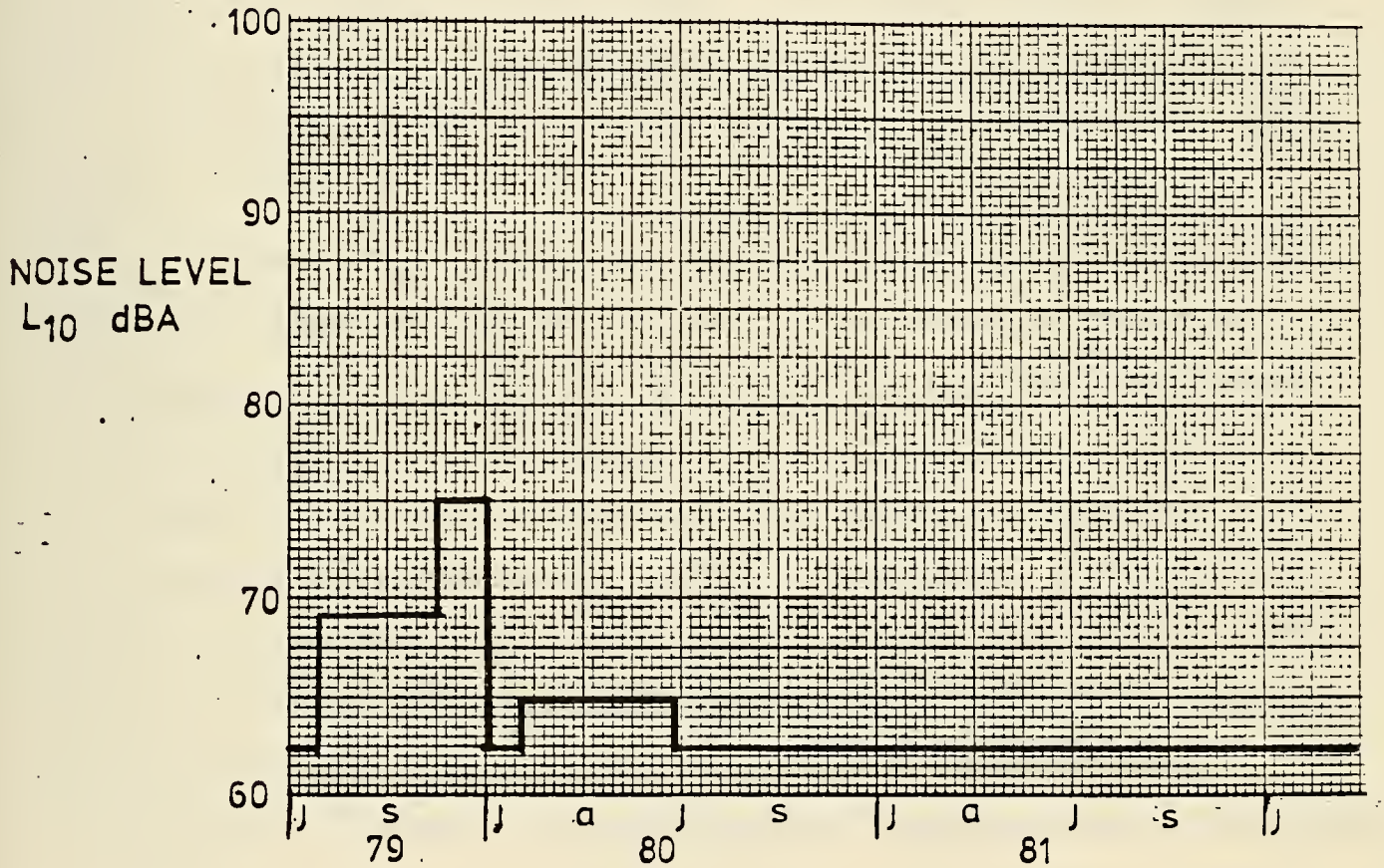

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FIGURE 12 RECEPTOR #7: RESIDENTIAL AREA OFF TYLER STREET 650' FROM SITE

construction site. These noise levels refer to exterior locations only. Interior noise levels from exterior sources will be reduced by an amount depending on the building type. The PPM 90-2 standard of the Federal Highway Administration suggests that a noise reduction of 10 dB (decibels) occurs with open windows and of 25 dB with closed windows. Also shown in these figures are the extimated existing noise levels from all other sources including the MBTA Orange Line, based on data presented in Table 5.

Two sets of noise contours were generated from the information shown in Table 13 for two representative construction phases. The noise contours reflect the noise shielding produced by local high-rise buildings. Figure 13 indicates L_{10} equals 75 dBA and L_{10} equals 80 dBA contours during pile driving construction phases. The L_{10} equals 75 dBA contour corresponds to City of Boston noise requlations for residential/industrial land use whereas the L_{10} equals 80 dBA contour corresponds to business land use. The pile driving phases of construction are expected to produce the loudest noise. The second set of contours shown in Figure 14 is similar to the first except that they were generated for the foundation/structural phases.

It should be noted that the noise contours do not indicate boundary lines where noise ceases to be an annoyance. They merely serve as a tool to determine which land use areas will be affected by the construction noise according to the City of Boston noise regulations.

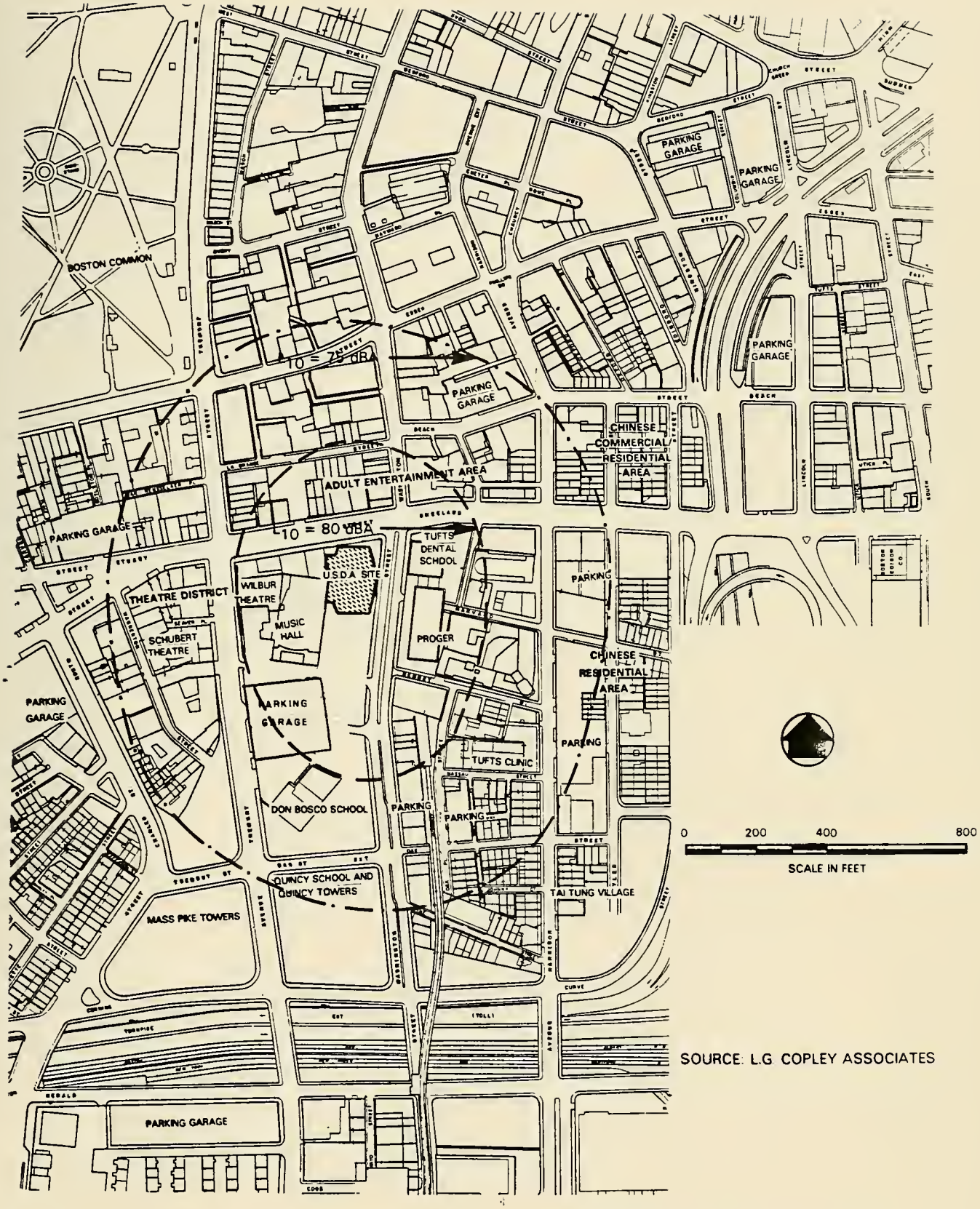
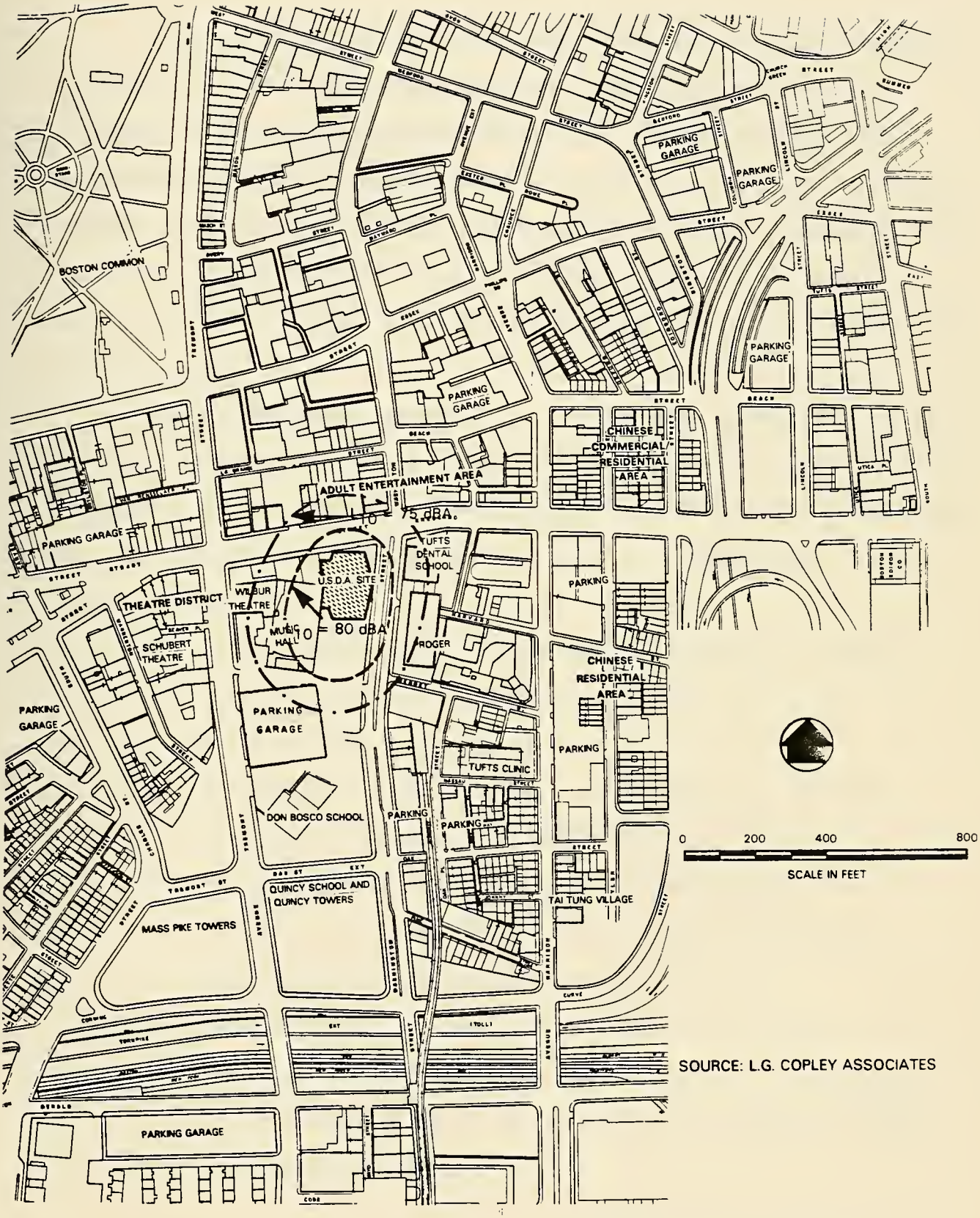


FIGURE 13 CONSTRUCTION NOISE CONTOURS DURING PILE DRIVING PHASES (4 NOV 79 - 19 DEC 79)



SOURCE: L.G. COPLEY ASSOCIATES

FIGURE 14 CONSTRUCTION NOISE CONTOURS DURING FOUNDATION AND STRUCTURAL PHASES (14 FEB 80 - 23 MAY 80)

The buildings that will receive most of the noise impacts are the Music Hall, the Tufts Dental School and the Proger Building. Noise forecasts indicate that these buildings will have noise impacts at their property line in excess of 80 dBA for several months, particularly while pile driving is underway. The Don Bosco School, Boston Floating Hospital and, to a lesser extent, Quincy Towers will also be adversely affected during pile driving.

Noise Abatement Measures. Considerable attention has been given to methods to reduce construction noise. The construction manager for the project, Gilbane Building Company, has indicated that it will take all feasible measures to reduce noise impacts. These include:

1. use of pre-augured holes for insertion of pilings;
2. rubber wheels and specified mufflers per Massachusetts regulations;
3. effective intake and exhaust mufflers on internal combustion engines and compressors;
4. inspection of all equipment to assure that it conforms with the appropriate requirements and rejection of any equipment which does not;
5. exploration into whether the use of hydraulic wrenches rather than pneumatic types is feasible;
6. restriction of truck haul routes to Kneeland Street to the Expressway;

7. constructon of a wooden fence around the site which will act as a noise barrier;
8. sound retardant housings or enclosures around noise-producing equipment;
9. conducting truck loading, unloading and hauling operations to control noise. This would include flattening the ramp during excavation and posting a City of Boston policeman to guide and control truck traffic;
10. an electrically operated personnel and material hoist as opposed to a diesel operated hoist; and
11. scheduling of all construction efforts to reduce noise.

The above measures will help reduce construction noise impacts. Nevertheless, there will be unavoidable short-term adverse noise impacts.

Geology

The project will not have adverse geological impacts. The architect and construction manager are aware of the construction problems associated with Boston blue clay and will be taking appropriate measures.

Vegetation and Wildlife

The project will not have a significant adverse impact on vegetation or wildlife. No significant resources exist on site.

Chemicals and Radioactive Materials

Chemicals and low-level radioactive isotopes will be used in the building. The procedures for their handling and disposal are discussed below.

Chemicals. The major laboratory activities that utilize chemicals are fat (lipid) extraction and food analysis. The fat extractions are generally accomplished by volatile solvents, which are used to extract the lipids from various types of solids such as feces, blood samples or animal carcasses. The procedure involves mixing the digestive solid phase with the solvent to extract out the lipids. This is then followed by a phase separation to collect the solvent extract. The lipids and other materials removed in this extraction are recovered through evaporation. Normally the extract is placed in a solvent hood where nitrogen or air is passed over the extract to evaporate and remove these solvents. The residual solid phase is then recovered for additional analytical testing. The solvent vapors released are normally vented up through the exhaust system out into the atmosphere. The total amount of vapor generated from the solvent vaporization step is small compared to the total volume emitted from the building and below any applicable emission standards for hydrocarbon emissions.

One of the steps involved in the food analysis involves digestion of the food sample by use of perchloric acid. This is done in specially designed perchloric hoods where any acid vapors enter into a glass-lined hood to pass through a scrubber system, which directs the acid to the waste drainage system and to the marble chip neutralization tank. The marble chips or limestone in this tank effectively neutralize the acid. The perchloric acid remaining in the sample after digestion is neutralized

before further sample preparation. This sample preparation would include extraction which is done on the neutralized sample. No acid, therefore, is generated from this extraction step.

The other chemicals that may conceivably be used in the laboratory environment would include acids, caustics and miscellaneous chemicals. The acids and caustics are normally disposed of in the sink. The caustic wastes do not pose any hazard in the wastewater and, therefore, there is no need to treat the caustic discharge. The acidic discharge may, in fact, cause corrosion in the drainage system. Therefore, all laboratory sinks are connected to the marble chip neutralization tank. This tank has a capacity of 500 gallons and can hold 5,000 pounds of marble chips or limestone. The marble chips or limestone neutralizes the acid and the discharge from the laboratory is either neutral or slightly alkaline.

Other toxic chemicals that are commonly used in the laboratory environment include metal salts such as copper, nickel or cyanides. Normally, the quantities of these materials are so small that there is no need to contain or isolate them from discharge into the drainage system. It is the practice of most laboratories to discharge them directly into the drainage system because of the low volumes used. In instances where high volumes or relatively high volumes are used, provisions are generally provided to separate these wastes into containers. Periodically, a licensed disposal service hauls away the substances to an approved disposal site. Generally, three types of waste

separation methods are employed. The first involves a container to store heavy metals. A second container is provided to store cyanides. A third container is provided to store organic solvents. Should it prove necessary to provide any of these containers, they can be readily implemented into any laboratory program to insure that no toxic chemicals are discharged to the drainage system.

Radioactive Materials. The radioactive materials the Nutrition Center will be using are low-level radioisotopes. These will be used primarily for labeling and tracing nutrients in experimental animals or in laboratory experiments. A Radiation Safety Officer oversees the handling of the materials.

The quantity of radioactive materials to be used is estimated as follows:*

- Not more than 10 millicuries per investigator at any one time.
- An average possession in this facility at any one time of 100 millicuries.
- An annual usage of 1 to 10 curies.

The types of radioactive isotopes expected are:**

- 70 percent carbon 14
- 25 percent tritium
- 5 percent other radioactive materials such as radioactive phosphorus, zinc or calcium.

*Estimated quantities are based on information provided by the Radiation Safety Officer for Tufts and Massachusetts Institute of Technology.

**Estimated types are based on information provided by Dr. Robert McGandy, Nutrition Center Program Committee.

Wastes from the radioactive material are placed in special waste containers in each laboratory. All waste is appropriately labeled with information such as type of radioactive material, dosage, use and date. These waste containers are picked up by personnel with the appropriate training who take the waste to the cold storage room where it is packaged in special containers for disposal. The container is permanently sealed when full.

Although a contract for disposal of radioactive wastes from this facility has not yet been negotiated, the contractor is likely to be Nuclear Container Corporation (NCC), who presently disposes of the wastes from many of the hospitals in Boston. NCC picks up the container on a scheduled basis and places it in a van which has monitoring equipment to detect radiation. The container is checked to see that no leaks exist and the material in the container is catalogued by NCC personnel. The material is transported to a special storehouse in Worcester, Massachusetts, where it is picked up every two weeks by Tri State Carrier. Tri State transports the waste to Barnwell, South Carolina for burial in a Federally regulated burial disposal site.

Socioeconomic

This section evaluates the probable socioeconomic environmental impacts of the proposed USDA Human Nutrition Research Center. It considers societal, Citywide and neighborhood impacts.

Societal Impacts. The scientific programs of the USDA Human Nutrition Research Center will have a beneficial impact on

the progress of nutritional research in the United States. The Center will address the issues of nutritional requirements for optimal health and well being, ways in which diet and nutritional status affect the aging process, and ways in which diet and nutritional status can prevent degenerative diseases and processes associated with aging. The studies will provide increased knowledge in this area and may lead to a better understanding of how improved physical and emotional health can be achieved during one's "aging" years. The possibilities for and implications of such research are unlimited, and will be very compatible with the type of programs carried out at the Tufts-NEMC Frances Stern Nutrition Center.

The Stern Center has been a major force in shaping nutrition policies across the country and is an acknowledged pioneer in nutritional counseling and training.* Complementary and cooperative study by nutrition professionals will be enhanced by the proximity of the Stern Center and the USDA Center, in ways that would not be possible if the USDA Center were situated in another part of the City or in a different city.

Citywide Impacts. The Center will also have socioeconomic benefits to the City of Boston. Although the Center is not employee-intensive, the fact that such a resource is located in Boston contributes to the image of the City as an area with top

*A Tradition of Concern, New England Medical Center Hospital, Draft No. 3, May 1979.

quality health, educational and research facilities. Such an image is an essential element of the City's revitalization efforts.

During construction the Center will have a short-term beneficial impact on employment. During the Center's 27-month construction period, the Center will employ an average of 175 persons per month.

A minor adverse impact of locating the Center in Boston is the loss of property tax revenue that could be obtained if the site were developed by a business or agency rather than the tax-exempt Fedeal government.

Neighborhood Impacts - Housing and Land Use. Some representatives of the Chinese community have raised several concerns about the impacts of the USDA Nutrition Center in their neighborhood. The major concerns are:

- The Center will cause further encroachment by medical, commercial, and office developments into the Chinese residential area.
- The Center will threaten the viability of low rise residential uses of land in the Chinese residential area.
- The Center will deprive the Chinese community of a site for badly needed housing.

These concerns have been considered and findings are as follows:

The Center will be constructed on a vacant site within the Tufts-NEMC area. The site is currently used as a parking lot.

The building will be surrounded on all sides by institutional or commercial buildings. The building does not represent an encroachment into the Chinese residential area.

Similarly, the Center will not threaten the viability of the low-rise Chinese residential developments in the area. The low-rise residential area is several blocks from the Center site and has coexisted for many years with neighboring institutional and commercial uses. In this regard, the newer residential developments in the South Cove area, such as Mass Pike Towers and Quincy Towers, have high-rise structures and are of a scale similar to the Center's. It should also be noted that within the City of Boston, low-rise residential areas exist successfully beside larger scale developments. Bay Village, Back Bay and Beacon Hill are all low-rise residential neighborhoods that interface in this manner; zoning has been an important tool in preserving the integrity of these areas.

The Center will not deprive the community of low and moderate income housing. To our knowledge, no serious proposals have ever been presented for use of the USDA site for low and moderate income housing and this is not a preferred site for housing. The shape of the site, its location at a busy intersection, its surrounding institutional buildings and its proximity to the Adult Entertainment District lack the environmental amenities that would make a site suitable for a low and moderate income housing project.

It could be suggested that while the Center does not directly deprive the community of housing, it indirectly affects housing because by locating the USDA Center on the site, Tufts-NEMC will lose the opportunity to consider use of the site for future expansion of its facilities. This may result in expansion of Tufts-NEMC facilities on other Tufts-NEMC-owned land that the Chinese community would like to obtain from Tufts-NEMC for housing. While to our knowledge, the USDA site has not been critical to what happens elsewhere on Tufts-NEMC-owned land, it is possible that the availability of the USDA site to Tufts-NEMC might affect its decisions about use of other more "sensitive" sites. However, this impact is very indirect and minimal, considering the uncertainties involved. These are:

1. Tufts-NEMC may have more potential uses than land available in the South Cove. Therefore, U.S.D.A. use of this small site may not influence long-term Tufts-NEMC land use decisions; and
2. If Tufts-NEMC used the USDA site rather than another Tufts-NEMC-owned parcel for a new building, the other parcel would not necessarily be suitable or available for housing development.

It appears that the Master Plan process holds the best prospects for addressing the issue of how the need for land for housing and medical institution uses in the Chinatown-South Cove area can be accommodated. The BRA is coordinating a Housing &

Land Use Task Force to facilitate community participation in the master planning process and to arrive at an acceptable Master Plan.

Neighborhood Impacts - Employment and Cultural Factors. The USDA Center may provide some employment opportunities for members of the Chinese community, but there will be no significant change in the current employment situation in the neighborhood.

The Center will have no adverse impacts on the cultural life in the Chinese community. However, the Center may contribute to the increased resentment of the Chinese community towards the medical, institutional and other development interests in the area. In order to mitigate this increase in resentment, the USDA should make every effort to be a "good neighbor". Mitigation measures that could be undertaken include effective affirmative action hiring practices for positions of employment during construction and operation phases of the projects.

Exhibits and educational materials distributed by the Center could also be made available in Chinese, since many area residents cannot speak or read English. The USDA could also organize a nutrition counseling service at the Center. In general, if USDA operations are conducted in a manner that promotes cooperation and considers how benefits to the Chinese community could be provided, the neighborhood impact of resentment should be minimized.

Neighborhood Impacts/Construction. Construction of the Center will have an adverse short-term impact on the quality of residential and institutional life in the Chinatown/South Cove area. As described in previous sections, construction noise, dust and increased congestion may be annoying to the people who live, work, shop, or visit medical facilities in the vicinity. It should be noted, however, that construction activity in the area is not a new occurrence. In fact, residents of the area have been experiencing construction activity for the past decade. During this period, Mass Pike Towers, the Church of All Nations, Quincy Towers, the Tufts Parking Garage and the Proger Building were constructed in the immediate vicinity.

To mitigate construction impacts of the USDA Center, appropriate construction techniques will be used as described in the Air Quality and Noise sections of this report. In addition, the construction manager will be sensitive to the community's needs during construction.

Cumulative

The proposed Nutrition Center is in the midst of an area for which there have been plans for revitalization for several years. The Park Plaza and South Cove Urban Renewal areas were designated by the BRA 10 to 15 years ago. More recently, the BRA has expanded the revitalization effort to the Theatre District Project. Much of the South Cove Project has been completed. Park Plaza has experienced delays due to environmental design problems and the Theatre District proposals are in the development stage.

Many of the proposed activities for these revitalization projects are just now beginning to take place -- both in the private and public development sectors. It is anticipated that much of the necessary construction activity associated with this development will occur over the next three years with many projects going on concurrently with the Human Nutrition Research Center construction.

The purpose of this section is to identify the major projects which are planned in this area, to indicate their proposed construction activities and schedules, to briefly discuss their probable construction impacts and to relate these impacts to construction of the Nutrition Center.

Each of the proposed projects is identified below and located in Figure 15. It should be noted that the construction schedules given for each of these projects are tentative and some will be expected to be slipped as the projects progress.

South Cove. The boundaries of the South Cove Urban Renewal Area are shown on Figure 15. Projects within this area which are anticipated to be constructed at the same time as the Nutrition Center include the New England Medical Center Hospital (NEMCH), the South Cove MBTA station, the Music Hall renovation, Tufts University Health Education and Sciences Building and Tremont Street Elderly Housing.

1. New England Medical Center Hospital and MBTA Station. The New England Medical Center is proposing to build a multi-story hospital building adjacent to the south

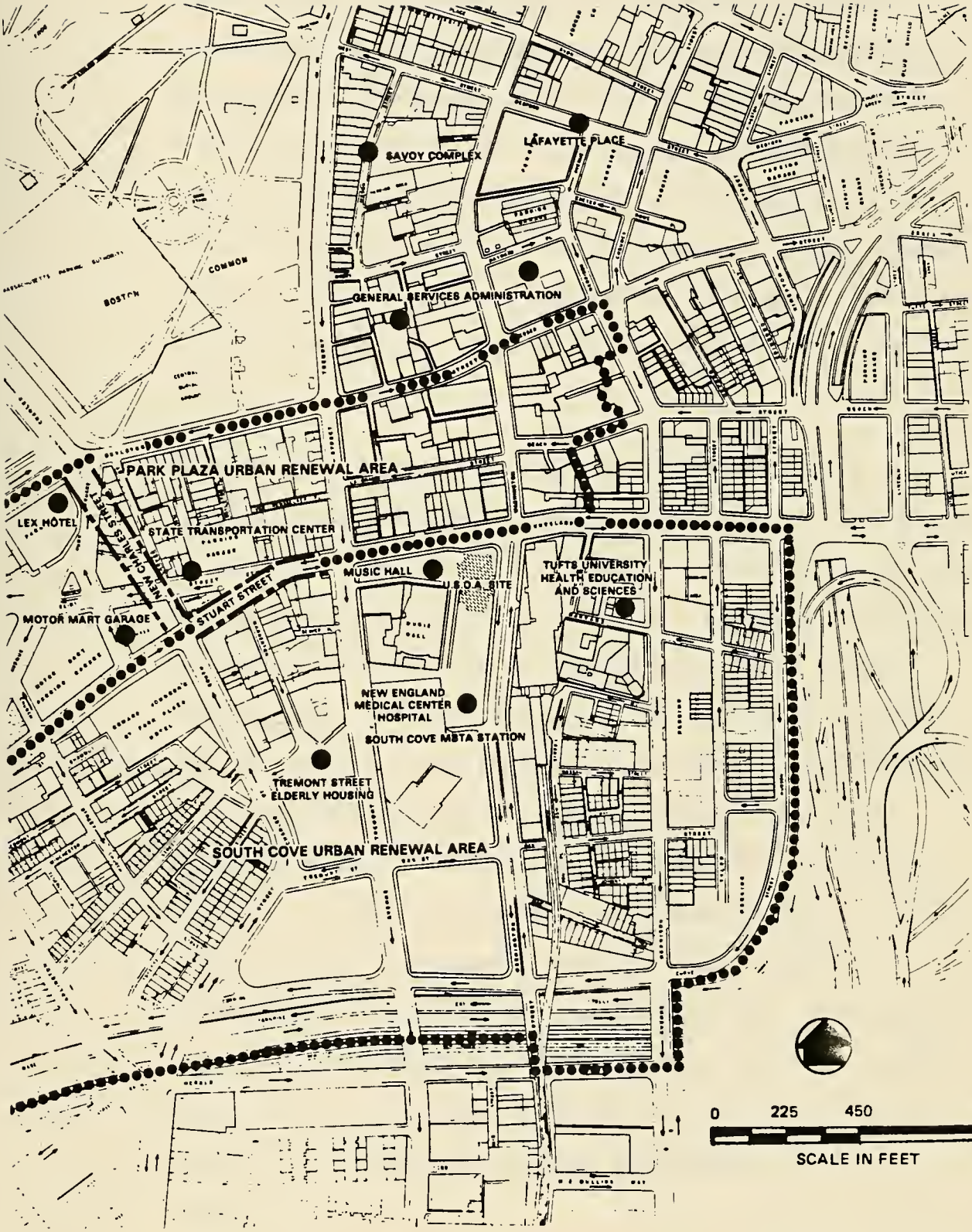


FIG. 15 CONCURRENT CONSTRUCTION ACTIVITY

side of the Nutrition Center on Washington Street. This building will extend into the air space across Washington Street and connect to the Proger building across the street. Vehicular access on Washington Street will be maintained as it is presently. No parking spaces are proposed with the building; however, there will be ambulance and delivery access. Within the same building, there will be a new station for the MBTA.

According to NEMC, the hospital construction is presently anticipated to begin in the fall of 1979 and be completed in the fall of 1983. Construction of this building will involve pile driving, which is currently scheduled for a period of approximately six months beginning in the fall of 1979. It will also involve structural work over Washington Street for a period up to two months during mid-1980. During this time, Washington Street will have to be closed to vehicular traffic. During the rest of the construction, traffic movement will be somewhat congested on Washington Street because of the heavy equipment which will be at the site and because of the number of delivery trucks which will be required for delivery of specialized hospital equipment during the completion of the interior.

According to the MBTA's design consultant, completion of the partially constructed station on the new Orange line route will be carried out between the summer of 1980 and the end of 1981. The north entrance of the station will be located in the NEMCH building and the two construction schedules will be coordinated. There will be some exterior demolition activity for a period of two to three months; however, most of the work for the station entrance will be on the interior.

2. Music Hall. The owners of the Music Hall Theatre located on Tremont Street are proposing to renovate and expand the theatre to the rear to include a new stage area which will be located next to the Nutrition Center on Stuart Street. According to the BRA, construction based on current scheduling is anticipated to begin in the fall of 1979 and be completed in the fall or winter of 1980.

3. Tufts University Health Education and Sciences Building. This project involves the construction of a multi-story educational facility on the corner of Harrison Avenue and Harvard Street. There is no parking associated with this project. According to representatives of Tufts University, demolition of existing structures on the site is anticipated to occur towards the end of 1979. Construction of the educational facility is currently anticipated to begin

in mid-1981 and to be completed in approximately two years (mid-1983). Construction details and methods are not available at this time since the building has not yet been designed.

4. Tremont Street Elderly Housing. Approximately 85 units of elderly housing are proposed to be included in two multi-story structures to be built on Tremont Street and Warrenton Street adjacent to the Bradford Hotel. Construction is expected to begin in the fall of 1979 and to be completed in the spring of 1981, according to the BRA.

Park Plaza. The boundaries of the Park Plaza Urban Renewal Area are shown in Figure 15. Major projects in this area which are anticipated to occur concurrently with the Nutrition Center construction include widening and relocation of Stuart and Charles Streets, the State Transportation Center, the Lex Hotel, and the Motor Mart Garage Renovation.

1. Stuart Street/Charles Street. The key to Park Plaza involves the widening of Stuart Street between Charles Street and Washington Street and widening and relocation of Charles Street between Stuart Street and Boylston Street. This will result in the elimination of Eliot Street. According to the BRA, this reconstruction will occur in two phases. The first phase, which involves relocation of utilities in the street, is anticipated to begin in the fall of 1979 and be

completed in mid-1980. The second phase, which will involve the remaining aspects of the construction and the actual street relocation, is anticipated to begin towards the end of 1980 and be completed by 1982.

Current plans call for maintenance of at least one travel lane on both of these streets during the relocation process. Complex travel patterns are expected to be worked out during each phase of the construction in order to maintain traffic flow.

2. State Transportation Center. The State Transportation Center will be a low-rise building that will cover much of the block on Stuart Street between Tremont and Charles Streets. This building is designed to consolidate the offices of the Massachusetts Department of Public Works (DPW), Massachusetts Port Authority and the MBTA. The building will include an underground parking garage with space for approximately 330 vehicles. The entrance to the parking garage will be on New Charles Street.

According to the Massachusetts DPW, construction is expected to begin about mid-1980 and be completed in mid-1983. Construction will not involve any foundation piles and almost no sheet piles. There will be a major excavation at the site with considerable truck traffic entering and exiting at the

southwest end of the site to remove the earth from the excavation. During construction, it is anticipated that there will be areas of Stuart Street which will be designated for material delivery and, therefore, will be closed to other traffic. During the construction of the foundation, there will be a major dewatering effort which will continue for a period of about one year. Demolition of existing structures is currently underway.

3. The Lex Hotel. The project involves conception of a multi-story hotel on the corner of Boylston Street and New Charles Street. Demolition of existing structures is anticipated to begin in January of 1980 and be completed in mid-1980. Hotel construction would then follow with anticipated completion at the end of 1982, according to the BRA.

4. Motor Mart Garage. The third major building of the Park Plaza Project in proximity to the Nutrition Center is a multi-story addition to the Motor Mart Garage. This structure, which has not yet been designed, is anticipated to include apartments and parking. It will be located at the corner of Stuart Street and New Charles Street. According to the BRA, it is hoped construction will begin during mid-1980 and be completed by the end of 1981.

The Theatre District and Other Projects. The Theatre District Project does not have any legal boundaries. Currently planned projects in the district include virtually all of the projects discussed previously plus the Savoy Theatre expansion, Lafayette Place and the GSA bulding.

1. Savoy Complex. This project involves the expansion of the stage for the Savoy Theatre and requires the permanent closing of a portion of Mason Street between Mason Street Place and West Street. Construction is anticipated to begin in mid-1980 and to be completed by mid-1982 according to the BRA.
2. Lafayette Place. This major project involves construction of 900 spaces of underground parking with 200,000 square feet of retail space above the parking area. It also includes an adjacent 500-room hotel. The project is located in the block between Washington and Chauncy Streets adjacent to the Jordan Marsh Co. store. Demolition of existing structures has been underway for some time and according to the BRA, construction of the new bulding is anticipated to begin early in 1980 and to be completed in the spring of 1983. Foundations will be on driven piles and the pile driving activity is anticipated to occur during 1980.
3. General Services Administration Building. At least three different sites are currently under study for

construction of a high-rise office building to house the General Services Administration (GSA) functions. Two of these sites are located in the vicinity of the proposed Nutrition Center - one is the block bounded by Avery, Tremont, Boylston and Washington Streets and the other is in the area currently occupied by 600 Washington Street and the Mechanical Garage. An environmental assessment is currently being prepared for each of the sites and it is anticipated that construction could begin before the Nutrition Center is completed.

Concurrent Construction Impacts A summary of the combined construction schedules for all of these projects along with the Nutrition Center is shown in Figure 16. An asterisk on the Figure indicates an unknown point in the construction schedule. Again, it should also be noted that although these are the schedules anticipated at this point in time, it is likely that schedules, including the one for the Nutrition Center, will slip as projects progress. Figure 16 indicates that, as the schedules are currently conceived, construction will be underway within this area from the present time until at least the end of 1983, well past the completion of the Nutrition Center. The maximum amount of construction activity will occur during the two years 1980 and 1981 when as many as 11 to 12 projects will be underway at the same time. If work progresses as planned, the majority of the pile driving activity will occur towards the end of 1979 and

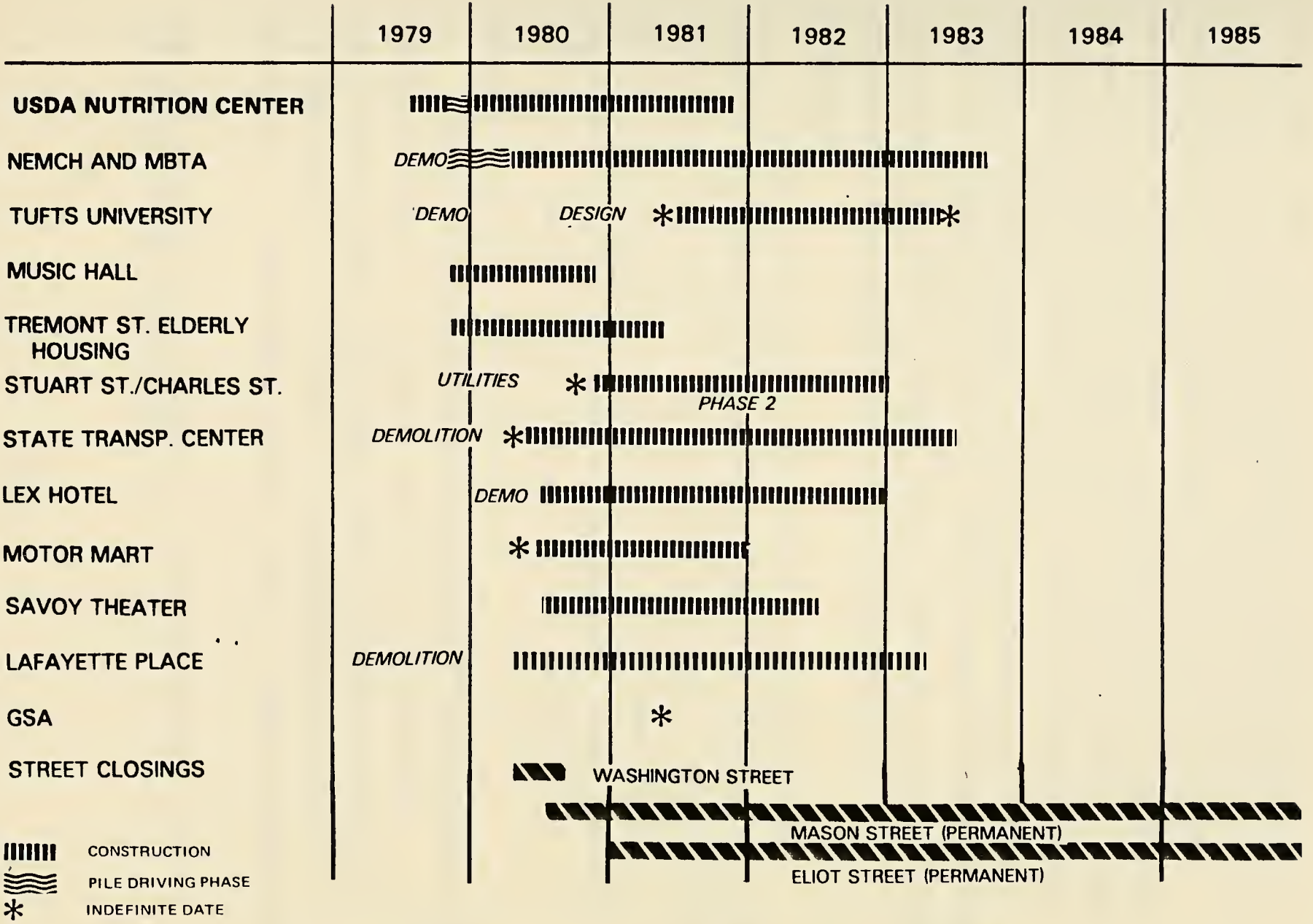


FIGURE 16. CONSTRUCTION SCHEDULE SUMMARY (AS OF JUNE 1979)

METCALF & EDDY

throughout 1980. Much of the external work on the building will be completed by the end of 1981. During this time period, it is anticipated that there will be continuous construction noise throughout the daylight hours. Vehicular access will be greatly disrupted, particularly along Stuart and Charles Streets. Pedestrian access along these two streets as well as adjacent to the various construction sites will be maintained but will probably result in inconveniences such as crowding through sidewalk tunnels and walking in torn-up, unpaved areas. There is also likely to be considerable dust and dirt in the air during periods of excavation.

The majority of this disruption will be caused by the numerous large construction projects within the immediate vicinity of the Nutrition Center. The construction impact of the Nutrition Center itself may serve to aggravate the disturbances caused by these other projects but would be insignificant, except for noise during pile driving,* when compared with the disruption anticipated from the other projects.

The BRA recognizes the potential for traffic disruption and nuisances during this period is committed to coordinating construction efforts. They have formed a committee to that end for the Park Plaza Project and are considering mechanisms to coordinate all construction activity. Many of these projects have

*The noise impact of pile driving is discussed earlier in the Noise Section of this chapter.

been preceded by environmental studies which have pointed out construction-related impacts and identified mitigating measures as has been done in this study of the Nutrition Center. The key, however, to minimization of these construction-related impacts is inclusion of these measures in job specifications and by enforcement of mitigating measures by the field engineers in charge of job site inspection.

CHAPTER 4

ALTERNATIVES TO THE PROJECT

Alternative Sites

Prior to the selection of Boston as the location for the Center, sites in other parts of the United States were considered. Boston was selected because of the outstanding medical research, medical universities and health facilities located in the Boston area.

Once Boston was chosen as the city for the Center, the site in the South Cove Urban Renewal Project was a logical choice. Dr. Jean Mayer, the President of Tufts University, is a renowned expert in nutrition and the Tuft's Frances Stern Nutrition Center has accomplished important work in this field. It was appropriate that the Center be affiliated with and located near the Tufts-New England Medical Center complex.

Alternative Size and Design

The site on which the Center is located is small and narrow. In order to accommodate the Center's activities, a 14-story building was required. Similarly, the orientation of the building was dictated by the site.

There was some flexibility with respect to specific design features of the building, such as access for service vehicles. The final design features proposed are the result of joint decisions of the USDA, the architect for the project and the BRA.

No Action

An alternative for consideration is "no action". This alternative assumes that USDA does not build the Human Nutrition Research Center and the site remains a parking lot. The impacts of this alternative are described briefly in the following paragraphs. This alternative essentially maintains the present status of the site and its environment.

Land Use. This alternative has an adverse land use impact. The site is located in a redeveloped downtown area and is inappropriate for surface parking on a long-term basis.

Socioeconomic. This alternative would have no impact on the existing socioeconomic environment in the site vicinity.

Transportation. Continued use of the site as a parking lot contributes to traffic congestion in the area.

Air and Noise. This alternative would not change existing air quality and noise levels in the site vicinity.

Aesthetics. The parking lot is an aesthetically unattractive use of the site.

Infrastructure. Under this alternative, there would be no increases in sanitary sewage, water use, energy or solid waste.

Geology. This alternative would not affect geological conditions.

Construction. There are no construction impacts associated with this alternative.

CHAPTER 5

ADVERSE ENVIRONMENTAL IMPACTS WHICH CANNOT BE AVOIDED

The Nutrition Center, when in operation, should result in some increased energy use, disposal of a limited quantity of chemical and radioactive materials, additional air emissions from the heating system and exhaust system, increased water usage and sewage, and some noise associated with the mechanical equipment. Provisions have been made in the building design and operation to minimize these impacts and the anticipated changes to the environment should not result in any significant adverse impacts.

During construction, there will be increased truck traffic, dust, and noise. Although construction practices will be employed to minimize these impacts, some short-term adverse impacts are unavoidable. Of these short-term impacts, the noise impact during pile driving is considered significant and adverse. Noise during this brief period will be disturbing to occupants of the site vicinity, particularly the NEMCH hospital patients in the Proger Building. Unfortunately, there is no method to construct the building on this site without the use of piles. This is a typical problem encountered in constructing high-rise buildings in downtown Boston and is unavoidable.

CHAPTER 6

THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

The research the Center will be carrying out is aimed at gaining new knowledge as to how diet and nutritional status influence the aging process. This knowledge could have significant implications for mankind in the long-term and is a significant positive benefit for the project.

There are no adverse impacts associated with the project which affect long-term productivity of the natural environment. The project represents a continuation of urban development on a site which in the past and present has been developed with urban uses and is surrounded by urban areas.

CHAPTER 7

IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The proposed project will result in some irreversible and irretrievable commitment of resources. The project will require a commitment of the natural resources of labor, materials and energy. The commitment of these resources is accomplished through a commitment of money. Therefore, the project also involves a commitment of financial resources. Although all these resources are important, none of them are considered irreplaceable or unique.